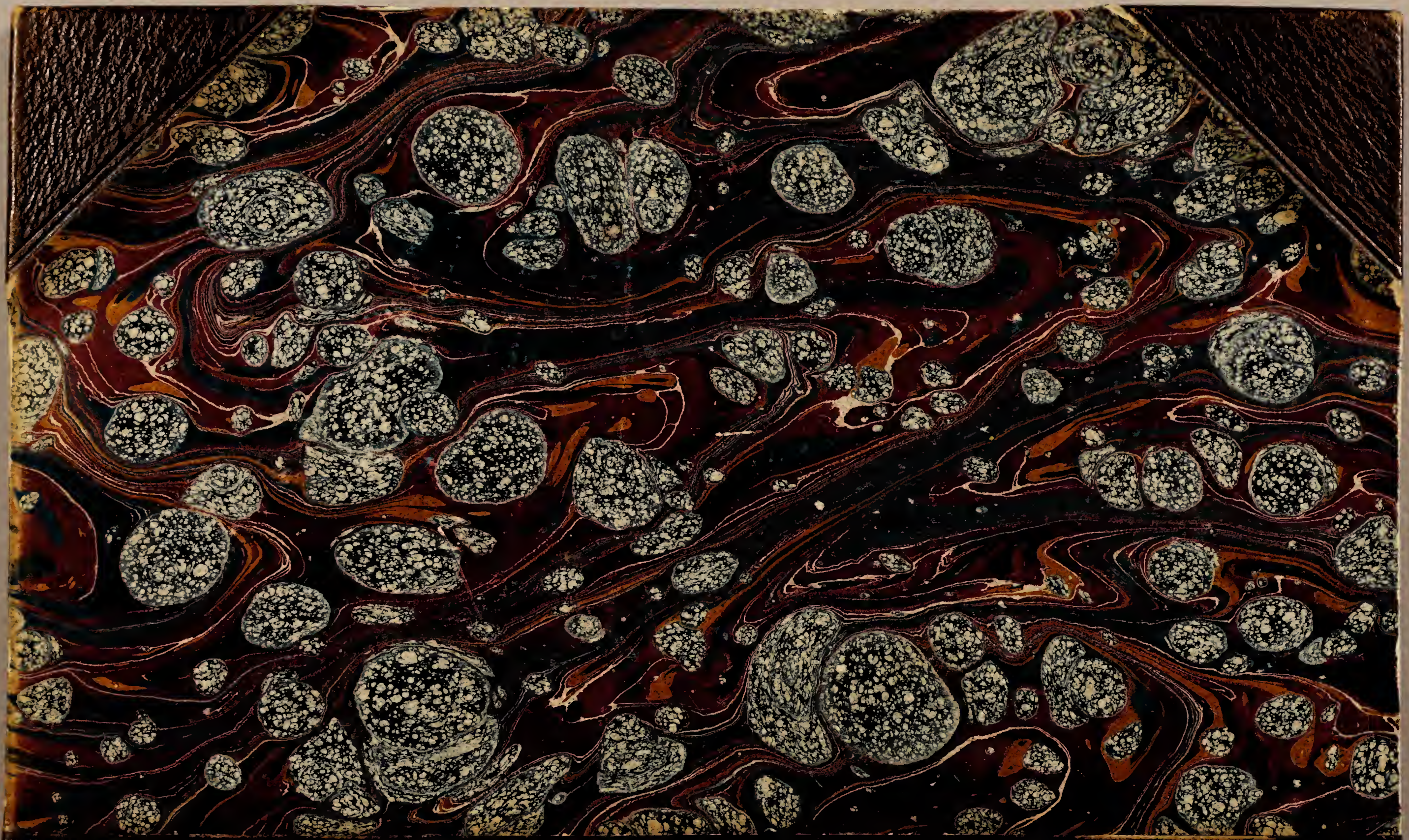

E. 3. 32.

JOHN CARTER BROWN

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LITT. D.

A Mirror for Mathematiques: A Golden Gem for Geometricians: A sure safety for Saylers, and an auncient Antiquary for Astronomers and Astrologians.

(··)

Containing also an order howe to make an Astronomicall instrument, called the Astrolab, with the vse thereof.

Also a playne and most easie instruction for erection of a figure for the 12. houses of the heauens.

A Worke most profitable for all such as are students in Astronomie, & Geometrie, and generally most necessarie for all learners in the Mathematicall artes. The contents of which booke you shall find in the next page.

By *Robert Tanner* Gent. practitioner in Astrologie & Philick.

¶ Imprinted at London by I. C and are to be sold in Paul,s Churchyard, by Richard Watkins. 1587.

¶ A moſt excellent quadrant, hauing a diſtinction of the whole Worlde.

A Materiall Sphere.
A Geometricall Triangle.
Iacobs Staſe.
The Viſuall shaddow.
A Geometricall rodde.
A Clock to be framed by the hand.
The paſſage of the night or Noctilab.
The vſe of the Cylinder, both howe they may be framed and and alſo vſed.
Regions and Citties ſubiect to the 12 ſignes and planets.
The proportion of meaſures, with neceſſarie rules for Captaines, Landmeaters, and Surnaiours.
Of the 12. ſignes in the Zodiack, how they are deuided, & what degrees euerie one containeth.
How manie miles vpon the earth anſwereth a degree.
what nũber of miles the whole circuit of the earth cõtaineth
Queſtions in Arithmatick of the Sunnes motion, hourlie, dailie, and yeerelie.
A Table of Longitudes and Latitudes, of the deſcription of countries, citties, townes & villages, in Europe, Affrica, Aſia, and America.
Alſo how to find out the diſtãces of miles between any two citties or townes mentioned in the ſaid Tables by the eleuations of the poles.
A perticuler Table of the Latitudes of the cheefeſt places in Spayne, and the Indies.
The names of the 32. poynts in the Shippe compaſſe.
A very eaſie rule howe to ſhift the Sun & the Moone.
A generall and briefe rule to knowe the diſpoſition of the wether.
A perticuler Table of the Moueable feaſts, ſeruing for fortie & foure yeres, according to their new order in forrain nations. Neceſſarie for trauailers & Marchants in theyr affaires and accounts making.

To the right Honourable Charles Lord Howard of *Effingham*, Knight of the most *noble order of the Garter*, *Lorde Admirall of England: and one of the Lordes of her Maiesties most honorable priuie Counsell.*

(§)

THE Cranes when they flie out of *Cilicia*, ouer the Mountaines *Taurus*, carrie in their mouthes a peeble stone, least by their chattering they should be ceased vpon by the Eagles. VVhich birds (right Honourable) might teache me silence, least mine ignoraunce beeing perceiued by your Honour, bewray my chattering to your noble and learned mind. The consideration of which, draue me at first into doubtfulnes, whether it were best to write, and so to showe my good will, or to suspend my pen, and so to hyde the same: But then I cõsidered, that the stone *Pyrites*, burneth not the fingers except it be broken: nor that the loue and

hartie affection of the minde is knowne, except by words it be opened. *Iupiter* hath not made a mans body like a Lattiſe, that the hart might be ſeene through the holes, but ſhut vp the ſame cloſe, that the tongue and pen ſhould bee the organes and inſtruments of the thought.

And albeit they are many who allured by your manifold vertues, regard you, & mooued through your true nobilitie, honour you: yet as one not inferiour in affection to any, but in good wyll ſurmounting many, I boldlie preſumed (leaning to your honourable humanitie, and your ſurpaſsing affabilitie) to imprint in the face of this my rude edition, the thriſe honourable title of your noble name: As a perſonage moſt meete, and bulwarke moſt ſufficient, againſt the barking imps of the enuious, and blunt haſty bolts of the fooliſh, who becauſe their eyes be ſore, cannot behold the Sun, and their wits too weake, are not able to penetrate the ſubtiltie of Mathematicall ſciences, and therefore eyther as flothfull neglect them, or as malicious wholy contemne them. But the Scarab flee & lothes the ſweete flower yet loues the corrupt fleſh. The Vulture forſakes the oderiferous ointment, to ſauor the dead carkaſſe, and the ignorant rather delight in fond fancies that are fooliſh, thē in graue Sciences which are ſerious. The multitude is more delighted with a ſong, which is common and barbarous, then that which is cunning & curi-

curious. But the ſtarres runne their courſe contrarie to the world: & the learned iudge otherwiſe then the idiot. There are many, with *Sytha* had rather heare a horſe neigh, then a muſitian play, and more there are, had rather read the poemes of Poets, which are but fables, then read the Mathematiques becauſe they are curious: like to the wooers of *Penelope*, who becauſe they coulde not be fauoured of the Miſtres, ſought to bee entertained of the maide. But as God & nature, hath plentifully endued your honor with th'ornaments of the body, ſo haue they more richly ſtored you with vertues of the minde, and therfore leauing theſe Batts that by reaſon of their feeble ſight can not abide the light of the day, to flitter in the darke ignoraunce of the night. I preſent to your honor with al ſubmiſſion, the protection, and correction of my ſimple labor, who as I know your learning can iudge, ſo I hope your wiſedome will couer the errors of my haſtie heade, together with the defects of my running hand.

Rhodopes pyramis was more ſtrange thē the ſtatelie building of Princes, not for the pride thereof, but her pouerty, and my labor more to be liked, as alſo my defects couered, then the defaults of the famous, not for the tytle of skilfulnes, but the Authors ready willingnes, beeing as deſirous to profit my Countrey, as thoſe that are beſt able to performe the ſame.

The Epiſtle.

The beare bringes foorth her young miſ-formed, yet by licking reformeth their ſhape, but my worke commeth out as an Abortiue, and ſo for lack of arte to fyle it muſt abide: eſpecially, for that I lack time to alter, skyll to frame, and knowledge to reduce it to a perfect ſhape, requiring your honor to eſteeme it, as it is, and fauourably to hide what ſo you finde amiſſe.

The ſmalnes peraduenture of the ſame may make it of leſſe account in the eyes of ſome, but your honor knowes, that though the pearle be but little, yet it may be of more price, then the greate Marble. And a worke though it ſeeme ſlender in ſhowe, yet may be of greater value then the large volumne. Mettals are not regarded for their quantitie, but their qualitie, nor bookes for their greatnes, but their goodnes, one dram of Gold, exceedes tenne pound of leade, and a fewe leaues, may bee better then a quier writte with great labor.

If I had any other thing to beſtowe vpon your honor, whereby to witnes my good will, which I knew you neded of, & I could ſpare it, except theſe fruites of my ſtudie, I would with all willingnes impart the ſame. But your honour knowes, the earth which yeeldeth ſalt, beareth no other thing, the Fountaine wherein glaſſe ſpringeth, produceth nothing els, & the ground that hydeth golde will beare no kind of graynes, ſo from a witt exerciſed in Letters, your honor wyll looke for no gyfts, but fruites of a wylling mind.

But

But leaſt I ſhould be tedious, I wyl conclude, remẽbring that *Protogenes* was reprooued, though otherwiſe a notable painter, becauſe hee could not plucke his penſill from the picture, and I may peraduenture be miſlyked, that can not remooue my pen from the paper, and therefore leaſt I ſhoulde ſeeme to haue entered a Laborinth without a a thredde, and beeing in can not finde the way out, I will conclude, craiuing your honour to receiue with cheerefulnes, to defend with willingnes, and to reade with freendlines, thys rude work, which I offer to your honor, as an outward ſigne of myne inwarde goodwill, ſo ſhall you incourage me here after, to preſent your honor with ſome worke of more importaunce. The God of heauen bleſſe and proſper in this lyfe, both you and yours, and ſende you in heauen moſt aſſured happines. Amen.

Your Honors moſt humble and daily Orator.

R. Tanner.

THE TRAVAILERS IOY AND FELICITIE.

¶ The first Chapter declareth the *Composition of the Instrument called the Astrolab.*

THis present Instrument is deuided into foure partes. The first part doth containe two thinges, the first is the face or forme of the Astrolab deuided into 24. houres. After the manner of a middle Horaloge, with 360. degrées of the æquator, the lines of the diuisions bëeng added with theyr numbers from 10. to 10. and this is termed of manie the Limb of the Astrolab. To this forme is ioyned a certaine Holownes, for the imposition of other partes or laminaries. Thys is called the mother of the Astrolab.

Of the which take this forme following.

The Trauailers ioy

Holownes the mother of *the Astrolab.*

IN the second place commeth the backe of the Astrolab, in which the degrées of the altitudes of euerie fourth part of the circle, with their numbers from 10. to 10. vnto 90. do offer themselues. After those do followe the degrées of the Zodiack, serving with their numbers from 10. to 10. for euery signe adding 30. to the which immediatly do cleaue ỹ names of the signes. Afterwarde the dayes of the yéere do follow

low distinguished, with the numbers, monethes, and their names, after the order & custome of the Church: betweene which, the Altimetricall Lather, for the dyuers Geometricall deuisions hath his place: and that there might be no voide roome, in the heade and top of the Lather spoken of, the bowes or arcs of vnequall houres beeing discribed to shew themselues.

Of this let thys Fygure folowing be taken.

The ſecond part in one Table, béeing plaine vpon one ſide, whereof are grauen the Almicantharath, that is, the circles of the progreſſions, from 6. degrées to 6. from the Horiſon vnto the Zenith of the head: and the firſt Almincarath of them, is called the Oblique Horiſon, that is to ſaie, the terminator or ender of ſight, in an Oblique Sphere, becauſe hee doth deuide the higher Hemiſphere from the lower, and whatſoeuer is vnder that circle, it is vnder the Horiſon, and whatſoeuer is aboue the ſame, it is aboue the Horiſon.

The Centrum of the inner Almincarath, is named the Zenith of the Countrey or Cittie, to the which the Table is made.

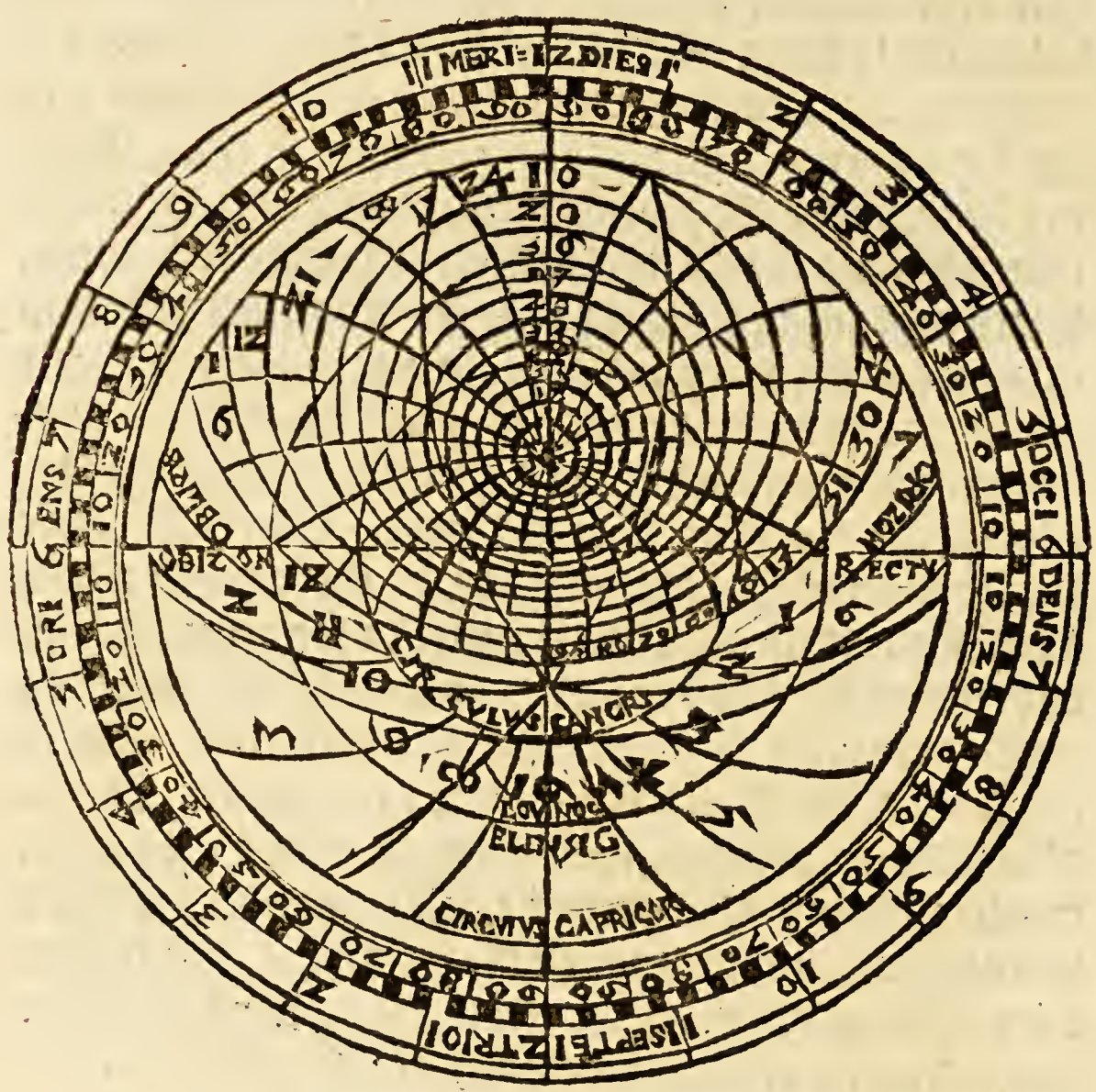
The Zenith of the Countrey or Region, is ſaid to be a prick in the Heauens, directly placed ouer the Countrey or Cittie: A Zenith doth cut betwéene theſe, that is: the ſmall bowes of the Alcitudes from 15. to 15. vnto 90. paſſing thorow by the Zenith of the head, and they are vnperfect circles, which the Latines do call Verticall circles, becauſe they are aboue the Crowné, that is, they doo paſſe ouer the Zenith of heads, and do diſtinguiſh the Horiſon into 360. partes.

Afterwarde folow two lines, ſtraightlie deuiding themſelues into the Centrum of the Table, of ẏ which the firſt doth deſcende from the Ring, thorow the Centrum to the part of the Table oppoſed and ſet againſt, and it is called the line of the middle heauen, and mydle night, ſo that the hygher parte of it, which is aboue the Horiſon, is called the line of the middle Heauen, or the line of the middle daie, and the other lower parte which is vnder the Horiſō, is called ẏ Angle of ẏ earth, or middle night: The ſeconde line which deuideth the

line

line of the middle Heauen, is the straight Horison, and belongeth to them which dwel vnder the Equinoctiall. Vnto these are turned in the circles of Capricorne, of the Equinoctiall, and of Cancer, all these thinges bée-ing séene, vnder the Horison short bowes do offer thé-selues framed for the declaration of vnequall howres, which beginning from the 1. in the West, are ended in 12. in the East, at the last, thorow all the plaines, and all the circles are drawne forth ỹ bowes of the 12. hou-ses, deuiding one an other in that place, where the Ho-rison of the Meridian lyne is ioyned. Likewise vnder the Horison of the contrarie side, there goeth a lyne from one extremitie & further part to the other, which doth shewe the first appearing as well of the morning as Euening, all these serue for the habitation, where the Pole of the North is eleuated 51. degrées. On the other side are séene all these thinges of the like sorte, for the eleuation of 48. degrées. The third part is also a plaine Table, containing all those thinges last spoken of, yet notwithstanding on one side for 45. on the other for 42. degrées of the eleuation of the North Pole.

Behold the Fygure folowing for the eleuation of 51. degrees.



The 4. part is the Voluel so called, containing the Zodiack of the 12. signes, with their degrées and numbers, from 10. to 10. also the most noble fixed starres, very necessarie to those which iudge of starres, which is called of the *Arabians* Alcabuth, but in Latine Aranea or Rete, signifying a cobwebbe or net, whose farthest and extreame part béeing hollow, is said to bee the waie of the Sunne, or the Ecliptica. And about the beginning in the same Zodiack, is left a certaine little tooth, which the *Arabians* call Almuri, but in Latine a poynter out, because it is that which poynteth out the degrées described in the Limb.

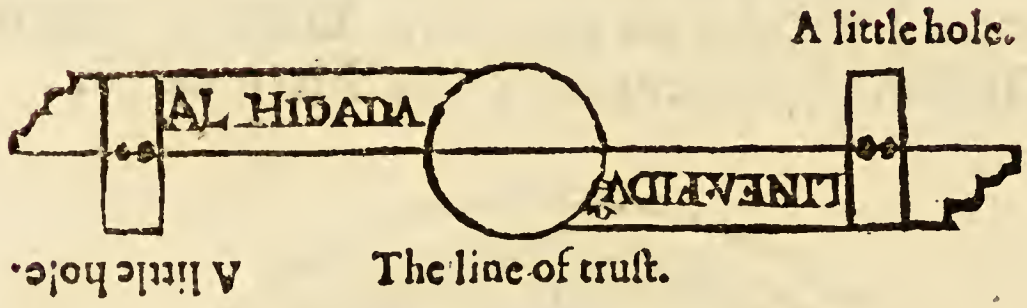
You

You must know that all signes with their degrées, and starres which are contained betwéene the Equinoctiall circle and the center of the Astrolab are called Septentriall, and that all which are without towarde the Circle of Capricorne, are called Meridionall.

At the last all these thinges are ioyned together, with Rules and Indexes, as followeth.

The Ruler or Voluel, which is turned in the back of the Astrolab, which Ruler is called Alhiada or mediclinium, in the which are put two little pynnes or Tables, to take the height of the Sunne in the day, and of the starrs in the night, of which one side, which goeth thorow, by the Center of the Astrolab, is called ỹ lyne of trust, because it bringeth credit of thinges practised there.

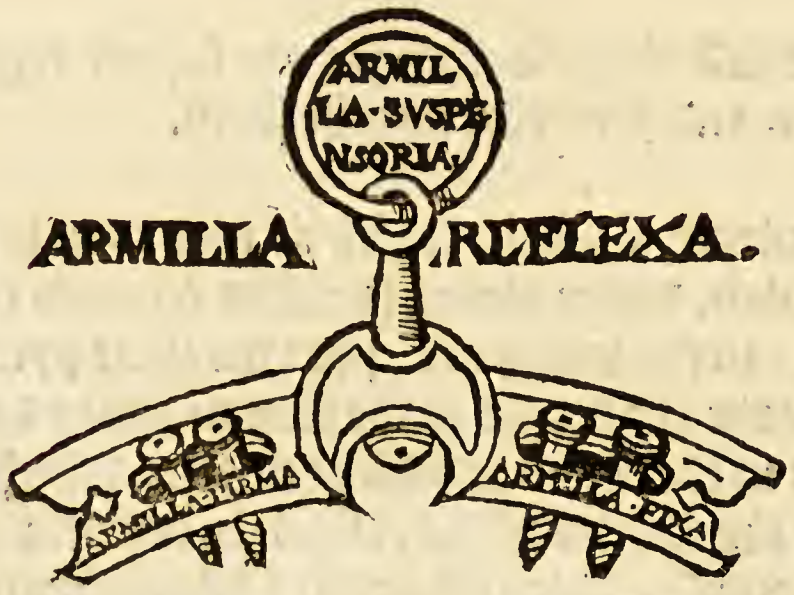
Beholde the Example.



The Ring hanging is an inſtrument by which the Aſtrolab is hanged, to take the height of the Sunne on the day time, or of the ſtarres in the night, and in the Arabian tongue, it is called Alanthica, or Alphantica, or Abalhantica.

The handle or nayle which faſtneth the ring with the Aſtrolab, of the *Arabians* is called Alhabos, ſome ſay Alhabos is an hollow hole, made in ſome Aſtrolabs, in which the ring is moued.

Of this let the Figure folowing be taken.



The

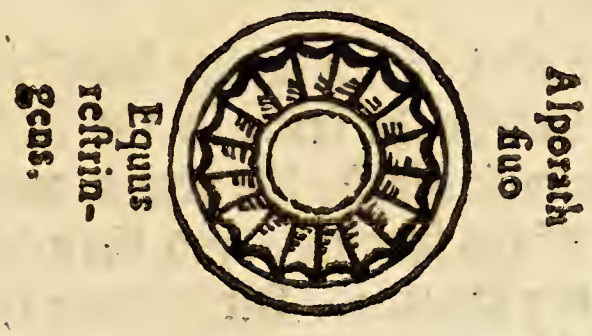
The hole in the Center of the Instrument going thorow the nett, and all the Tables is called of the *Arabians*, Almchan.

But the Nayle entering into that hole is called an Axile trée, in the which Axile trée there is a certaine hole, which in Latine is called Stabulum, a stable, but of the *Arabians* Alchitot.

The Figure doth folow.

But the Nayle entering into that hole, tying the Aranea, with the little whéele, is called Alphorat, that is to say, an horse.

Beholde the Example.



And so you haue all the explanation of our Astrolab. Let vs procéede further.

The second Chapter, of the finding out the motion of the Sun.

THE place of the Sunne is very fitte in all busines, if you therefore desire to haue ỹ true motion of the Sunne by the Astrolab, place ỹ side of the ruler (which is called the Lyne of truth) in the backe of the Astrolab, ouer the day purposed, in the circle of the dayes and monethes of the yeere, and by and by the degrée doth appeare to the touching of the Ruler, in the Orbe of signes, called the true place of the Sun, to the Meridinal time of the day purposed, the which place, to what signe it dooth appertaine to, and of what quantitie, the signe and number in the next place, the spaces of the lynes béeing set vnderneath, doo make manifest. But in a yéere twyse fertile, in which February hath full 29. daies, we must goe for the 29. day, to the first day of March, and for the first day of Marche to the seconde of the same Moneth, and so likewise vnto the end of the yéere.

The degrée of the Sun béeing found in the backe of the Astrolab, marke the same in the net placed in the Zodiack. Likewise marke the degrée opposed directlye to the degree of the Sunne, and they call that degree the Naidar of the Sunne. Kéepe these thinges in memory, because they dw stand in stedde for those that followe.

The 3. Chapter to knowe the the height of the Sunne, euery howre of the day, that is to say, by how many degrees, the center of the Sunne is eleuated from thy Horison.

HAng the Astrolab by his Ring on the thumbe of the right or left hand, that it may hang without let, and set ẏ backe of the same against the beames of the Sunne, and by a little and little heaue vppe or weigh downe the Inder, vntil you sée the beames of the Sunne appeare thorow bothe the little holes or pinules, and when you haue séene this, marke diligentlie by how many degrées the Inder is eleuated, according to his right line, & it is that line, which goeth from the beginning of Aries by the Center of the Astrolab, by reckning in the fourth degrée of Altitude, by taking from the Diameter those thinges which are transuersed and turned on side, and the number of those degrées shalbe the height of ẏ Sun at the instant of thy consideration. An example is not necessary for the slightnes of the thing.

The 4. Chapter dooth teache to enquire out the equal houre, that is the vsuall houre of the Horaloge or Dyall.

LEarne the true degrée of the Sunne, vnto the day appointed, after the manner before declared, which degrée, marke with some materiall note, or note of me-

morie, by the inſtruction going before and out ẏ height of the Sunne, which ſerche out, eyther before or after none, eleuate therefore the degrée of the Sunne, ſigned out in the Nett, by ſo great height betwéene the Almicantharath, how great ſoeuer the height of the Sun is found in the back of the Aſtrolab, and finiſh this in the Orientall part of the Aſtrolab, if the height be antemeridinall, or in the Occidentall part, if it bee poſt meridinall, which béeing done, the Nette ſtanding vnuariable, ioyne the Inder to the Sunnes degrée, and ẏ top of the ſame in the Circles of the hourely Limb, wyll ſhewe the equall houre with their fractions (if there be any) you may know that one degrée in the Limb, doth appoynt foure minutes, 15. degrées one houre, 60. minutes likewiſe, which is alone, as if you ſhall multiplie 4. minutes by 15. for in the ſumme you ſhall haue 60.

Take this example, the 30. day of March I woulde know the equall howre of the day, before none, therefore I loke out the place of the Sunne in the backe of the Aſtrolab, which I finde in the 18. degrée of Aries, afterward I take the height of the Sunne, according to the inſtruction aboue gyuen, which height I find to bee 41. degrées. I place therefore this ſayd degrée of ẏ Sun in the Zodiack of the Nette, ouer the Almincarath, 41 in the Orientall part, and I bring the Ruler preciſelye vpon the degrée of the Sunne, and ſtraight it appeareth in the limb, the ninth houre to be gone backe with 10. degrées, which degrées I multiplie by 4. and they amount to 40. Wherefore I ſay it to be the 9. houre and 40. mynutes paſt.

The

The 5. Chapter doth teach to know artificially the equall houre in the night time.

IN a cléere night, marke the height of a knowne or fixed Starre, placed in the Nette, what part of the Heauen it doth possesse, and account the same height, betwéene the Almicantharath in ỹ parte in which you had consideration of the Starre, and put the head of the same Starre vppon the ende of the accounted height, that is to say, turne or wind about the Net, vntill you haue ioyned equally and euen to the terme and ende of the height, numbred the toppe of the Starre: the Nette standing vnmoueable, apply the Inder to the true degrée of the Sunne, and straight way you shall sée the equall houre in the Margin, or Limb: which thou shalt finde to bee before the middle of the night, if the degrée of the Sunne shall bee founde before the Angle of the Earth, but contrariwise, if after the Angle of the Earth. The operation is like by the wandering Starres, the true place béeing taken, and the breadth of some planet by the Tables, or other wise, which béeing signed in the Zodiack of the Net, do fulfill almost the turnes of a fixed Starre.

❧ The 6. Chapter doth easilie teache to trye the height of Starres in the night time.

IN the Nette of the Zodiack some Starres cleauing to the Heauen, are described moze clære, which commonly we call fixed Starres. It is profitable therefoze to him that desireth to take the height, to loke into one of the fixed Starres in the Nett, as Aldebara, Cor Leonis, oz Spica, oz some other appearing vpon the earth, after this manner, lift vppe the Instrument on high, placing it vpon your eye, and direct the side of it to the Starre beheld, as much as may be. Afterward, putting your eye vnder the lower little pynne of the Inder, moue it vpward and downward, vntill the sight of the eye dw loke thozowe bothe the holes, therefoze in beholding the Starre, consider the part, into which the lyne of the Inder falleth, and howe much it is vnder the Horison, and marke this, and the height of the Starre, cal it Meridian, oz after Meridian as befoze we willed of the Sunne, you may set downe an example of your selfe easily if you bee not altogether ignozaunt,

¶ The 7. Chapter of the rysing and setting of the Sunne.

PLace the degrée of the Sunne, noted in the Nette of the day offered, vppon the first Almincarath of the East part, and the Ruler bæing applyed, wyll shew to thee, the time of the rysing of the Sun in

in the Limb, that is to say, in what houre and minutes it is perfected: after the Nette beeing turned about, place the degrée of the Sunne to the Occidental Almicantharath, and the Inder in the touching together of equall houres, shall make manifest to thee, the time of the setting of the Sunne.

¶ The 8. Chapter doth declare the length of an Artificiall day and night.

THE degrée of the Sunne béeing put vnder, to the first Almicantharath in the Orientall part, marke diligently wyth a note the Inder ioyned to the degrée of the Sunne, in the degrées of the Limb. Afterward moue the degree of the Sunne with the Nette by the Meridian, vnto the last Occidentall Almincharath, and the Inder béeing ioyned againe, set some marke on the Limb, which done, reckon the degrées of the Limb, which haue the office of the æquator from the first marke or note, according to the motion of the Nette, and of the degrée of the Sunne into the second marke, and you shall haue the Diurnall bowe or Arce of the Sunne, which if you shall substracte from 360. degrées, the Nocturnall bow of the Sunne, shall remaine residue: these béeing had, if you desire to know the quantitie, or length of an Artificiall day, number the howres and minutes which are contayned betwéen these two markes and notes, or deuide the Diurnall bowe by 15. which is the same, and thou shalt haue thy

purpose: likewise goe to worke with the bowe of the Night, if you desire to knowe the quantitie of ỹ night, take this example. I would knowe the Diurnall bowe, the 5. day of March. I find therefore the Sunne in the 24. degrée of Pisces, which degrée I place vppon the rysing Horison, and I make a marke to the place of the Ruler, in the degrées of the Limb. I do the like in the Occidentall Horison, betwéene these two markes, I gather 175. degrées of the æquator, béeing the Diurnal bowe of the Sunne of the day propounded, which if I substract from 360. degrées, I finde the Nocturnall bowe 185. degrées, also if I deuide the Diurnall by 15. I gather in the sum, the quantitie of the daie to be 11 houres, and 40. minutes, which béeing substracted from 24. dooth leaue the quantitie of the night to bee 12. houres, and 20. minutes, the matter is easie, I passe it ouer.

¶ The 9. Chapter of the rysing and falling of fixed Starres.

THe rysing and falling of fixed Starres is diuers, that is to say, of the Heauens, tempozall and Astronomicall, of which in an other place it is sufficiently handled. But héere wee will not distinguish that which pertaineth to the Heauens from tempozall, wherefoze we must speake of the rysing and falling after a larger manner. Therefoze, then is the rysing of a Starre, when it ascendeth from the lower Hemisphere to the higher, which happeneth to a Starre once in a naturall day, the falling of it is, when it descendeth from

from the higher Hemisphere to the lower: wherefore you must vnderstand the houre, or part of the howre of the Sunne, in which the Starres dow steadfastly ryse and fall, also the time of the rysing and falling is somewhat diuers, according to the alteration of the Sunne thorow the signes of the Zodiack: There is an other rysing and falling of a Starre, not referred to the Sun but to the Starre it selfe, as when at other times wee made mention of the houre of the Starre, and not of the Sunne, imagine therefore, a starre to stand in stead of the Sunne, then if you shall ioyne the Starre to the Orientall Horison, and shall bring the Index by it, you shall learne straight in the margine at the place of the Index, the rysing of the Starre, and if you ioyne it then to the Occidentall Horison, you shall knowe the fall. But they which inhabit the Septentrio, haue some Starres neuer rysing or faling, which of necessitie doo appeare at all houres, (but the light of the Sun dooth hinder it) as all the Starres are to them which inhabit the seauenth Clymat of the lesser Arck, and they principall Starres of the greater Arck, of Draco, Chephei, Cassopeia, some Starres of Cignus, Perseus, and of Auriga. For all the Starres of the Aranea of our Instrument, which dow not touch the Horison in his turning about, dow neither ryse or fall, but dow continuallie appeare. Other Starres rise and fall, as are the signifying Starres, and manie other, for what Stars soeuer of the Aranea, are kept vnder the Horison, wee conclude iustly, that they fall and rise, to which our proposition shall be applied after this manner, frame the Starre purposed in the Nette, for the day offered, in the rysing Horison, and drawe the Index by the degree of the Sunne of the daie offered, the same time in the meeting and touching together of the Limb, will make

manifeſt the ryſing of the Starres in the houres and minutes, which ſtarre, beeing put ouer to the Occidentall Horiſon, the Inder cleauing to the Sunnes degree, will open his falling. But whether ſuch ryſing or falling may be done in the night or day time, that is eaſie to be knowen eſpecially, if you haue learned thoſe thinges well, which we haue taught you before, about the ryſing and ſetting of the Sunne, and the finding out of the howres of the day and night: Wherefore I ouerpaſſe it wittingly. In like ſort you ſhall finde the time of the ryſing and faling of wandering ſtarres, when you ſhall marke the places of them to bee equall in length and breadth.

¶ The 10. Chapter of the finding out of vnequall and planeticall houres.

YOu ſhall know the vnequall howre of the day by this ſhort Rule, if you ſhall ſearche out the equall howre, by the Inſtruction aboue giuen, which being found, the degree beeing oppoſed to the degree of the Sunne, (which the Aſtronomers call Nadair) ſtraight in the roomes or places of vnequall howres, dooth declare the planeticall howre, that is to ſay, the 1. 2. 3. 4. and 5. antemeridian: the 6. meridian, but the 7. and 8. 9. 10. 11. 12. poſtmeridian: according as thou haſt obſerued the equall houre before or after noone. And if the Nadair of the Sun ſhal fall into the lyne of howres, ſay the howre to bee ended according to the aſcription of the numbers, and the howre

howze folowing to beginne. But if the Nadair shal fal vpon the space which is betwéne the two lines, ỹ lyne going before doth declare the houre to be ended, but the lyne folowing doth declare ỹ houre going onward, and to be vnperfect. But if you desire to know the vnequal howze of the night, learne first the equall howze, and the Nette standing with his Inder in the bowes of vnequall howzes, the degrée of the Sunne doth declare vnto thée the vnequall howze: and these howzes begin ning in the West, do fall in the rysing of the Sunne. The matter is plaine, it nédeth no example. By thys manner you shall finde out the vnequall howzes, in the backe of the Astrolab. The little bowes of the howzes vnequall, are framed in the backe, ouer the Lather of measure of height. Therefore learne the Meridian height of the Sunne, to the day propounded, which béing founde, in the touching of the lyne of the 6. howze sette a marke on the Inder, and you shall kéepe thys marke two or thrée daies if you please, because in that while, it will not be greatly altered. Last of all, the sun shyning, take the height of it before or after noone, and themark of ỹ Inder spoken of, the same height standing still, doth shewe the vnequall howze to thée, concerning the dominion of the Planets in vnequall howzes. I let it passe, because the matter is commonly knowen euery where.

(..)

¶ The 11. Chapter doth teache to number the declining of fixed ſtars and of euery degree of E-cliptick.

PLace the Starre, Sunne, or degrée of the Zodiack, whoſe declyning you deſire to knowe, vpon the lyne of the Meridian of the Inſtrumẽt, and marke how many degrées it is eleuated from the Horiſon betwéene the Almincarath, and kéepe the number. After, put the firſt lyne of Aries or Libra vpon the ſame meridian lyne, and likewyſe marke the height thereof from the Horiſon, betwéene the Almincarath, and kéepe the number: take the leſſer number from the greater, and that which remaineth, ſhall bee the declyning of the Starre propounded, of the Sunne, or of the degrée of the Zodiack, and it ſhall bee Septentrionall, if the height of the ſtarre, or Sunne, & ſo forth, ſhall be greater then the height of Aries or Libra, but if contrarie, it ſhall bee Meridionall.

An Example.

The Sunne is offered to me poſſeſſing the 28. degrée of Aries, I am wylled to number the declination of the Sunne, and I place the 28. degrée of Aries vpon the Meridian lyne, and ſée the Meridian height to bee 52. degrées, which I kéepe. Likewyſe I place the beginning of Aries vpon the ſame lyne, and I finde the heyght to be 41. degrées, and almoſt 20. minuts, which

also I kæpe. I take away ỹ second height, because it is lesser then the first, & there remayneth 10. degrées and 40. minutes, bæing the declyning of the Sunne and Septentriall, by reason that the height of the Sunne is greater then the height of Aries.

¶ The 12. Chapter doth teache by what way you must serche out, in what Clymat any one is which straieth in the Sea, or wildernes.

N the day time we take the Meridian height of the Sunne, after the manner before expressed, likewyse we shall learne by the way folowing, the eleuation of Aries or Libra, that is, of the æquator, and last of all, the breadth of the place vnknowne in which we liue, wæ shall finde out the same breadth in the Tables of the Clymats vnder written, and straight it appeareth in what Clymat, beginning, middle, or ending of the same, in the night time we shal finish the same by some fixed starre, placed in the Aranea of the Astrolab rysing and falling, by the office of the Astrolab, wee obserue the height Meridian of a knowne starre appearing ouer the Horison; which had, we finde out the e-

leuation of Aries, or Libra, and at last, the breadth of the place considered, by which, with the helpe of ỹ Table of the Clymats we shal worke, as we haue spoken, and we shall haue our account, by example you shall receiue it more certaine.

Marke the Meridian height of Spicæ Virginis, which I finde to be 40. degrées, likewyse I looke out the eleuation of Aries, or the æquator, which I finde to be 54. degrées and 16. minutes. Further, I looke out the breadth of the place considered, vnknowne, and find it to be 35. degrées, 44. minutes, which breadth founde in the Tables of the Clymats, I doo say the place vnknowne considered in this manner, to bee contayned betweene the beginning and middle of the fourth Clymat, which thyng was desired for.

¶ The Ta-

THE TABLE OF
THE CLIMATS.

51	The degree of breadth.		degree of breadth.		degree of breadth.		degree of breadth.		degree of breadth.	
50	the end 7.	40	the beginning.	5.	30	the middle. 3	20	the ende. 1.		10
49		39	the ende.	4.	29		19			9
48	the middle. 7.	38			28	the begin. 3.	18			8
47	the begin. 7.	37			27	the begin. 3.	17	the ende. 2.		7
46	the ende. 6.	36	the middle.	4.	26		16	the middle. 1.		6
45	the middle. 6	35			25		15			5
44	the begin. 6	34	the beginning.	4.	24	the middle. 2.	14			4
43	the ende. 5.	33	the ende.	3.	23		13	the begin. 1.		3
42	the middle. 5.	32			22		12	of the Climat.		2
41		31			21	the begin. 2.	11			1
					The æquator.					

and felicitie.

fol. 16.

The 13. Chapter of taking the height of some Place, Region, or Towne.

Earne the Meridian altitude of the Sunne, and if the Sunne in the Meridian time shall come to the beginning of Aries or Libra, (which rarely happeneth) the meridian height doth showe the eleuation of the beginning of Aries or Libra, vpon the Horison, by the folowing of the æquator of ỹ circle, which height bæing substracted from 90. degræs, doth leaue ỹ breadth of the Cittie. But if the Sunne shall be found in some Septentriall signe: know his Septentriall declyning by the rule going before, which take from the meridian height of the Sunne, and the eleuation of Aries or Lybra, and of the æquator will be manifest, (which as wee haue admonished) bæing taken from 90. degræs, doth minister the breadth of the Region, or the eleuation of the Pole. But if the Sunne goe by the meridian signe, add his Meridian declining bæing found out to ỹ height of the meridian, and the eleuation wyll appeare of Aries or Libra, which bæing taken from 90. degræs dooth finish thy purpose. But in the night time, you may after this manner obtaine the like, by some fired Starre which ryseth and falleth, which is knowne to thee, mark the meridian height thereof, also the Septentriall declyning, or Southerlie, as thy busines requireth, which being had, thou shalt goe to worke, as wee haue declared aboue concerning the Sunne.

The

¶ The 14. Chapter doth teach to knowe, to what Climat, Region, or Towne the mother of the Astrolab is framed.

YF you doubt to what breadth, or Pole eleuatiõ of Climat region, or Towne, the mother, or some Table placed in the Astrolab is made: account the degrées in the meridian lyne, and the minutes if there be any, in the Almincharath, from the æquinoctiall cirkle, vnto the Zeneth of the head and the number of Almincharath dooth showe the breadth, which knowne, you shal easily be brought to the knowledge of the Climat, Region, or Towne.

¶ The 15. Chapter doth declare the degree of the Ecliptick, with the which the Starre described in the Nette doth rise and fall.

FIrst ioyne the toppe of the Starre offered to the rysing Horison, and straight in the Ecliptick line the degrée wil appeare with which the Starre doth arise. The which degrée, of what signe it is, & what quantitie, you shall easily learne by the ascriptions of the name and number. Further, apply the head of the Starre to the compassed Nette, in the falling Horison, and againe you shal sée the degrée in the Ecliptick, with

which the Starre doth ſyde and fall, the name of the ſigne, and the quantitie of degrées béeing added. I ſuppoſe examples are not neceſſarie, the thing is ſo eaſie, by the ſame rule, you ſhall ſearche out, with what degree of the Eclipticke anie ſtarre doth goe in the midſt of Heauen, you ſhall eaſilie finde, if you ioyne the toppe thereof to the meridian lyne.

The 16. Chapter dooth profitably ſearche out the Zenith of the ryſing and ſetting of the Sunne and of fixed Starres.

When you deſire to knowe the Zenith of the ryſing and ſetting of the Sunne, or ſome other fixed ſtarre, ſette the degree of the Sunne, or the toppe of the ſtarre vpon the ryſing Horiſon, and at ỹ place of the degrée of the Sunne, or top of the ſtarre, ſette ſome marke on the Horiſon. After by the helpe of their Azenith, account the degrées of the Horiſon contained betwéene the Eaſt, that is, the Equinoction, and the marke made, and the number of the degrées which endeth in the marke, wyll open to thee the Zenith of the ryſing of the Sunne or ſtarre, that is to ſay, the diſtaunce of the ryſing of it, from the ryſing of Aries or Libra, and ſuch a Zenith of ryſing is ſayd to be meridionall, if it ſhall be found in the fourth, firſt, or Septentriall, if it be found in the fourth: and vpon the like number of degrées of Azenith, ſhalbe the Zenith of ſetting, and alſo in the like fourth, whether Septentriall or meridian.

The

The 17. Chapter, of finding out the Zenith of the Sunne, and fixed Starres.

YOu shall find the Zenith of ẏ Sun, that is to say, the distaunce of the Center, from ẏ beginning of some fourth part, at the houre appointed by ẏ office of the Astrolab, marke the height of the Sunne, then the degrée of ẏ Sun must be put into the Nette, vpõ the like number of the height obserued in the Almincarath, in the same part in which the Sunne was, as you accustomed to dw in finding of the houres, and the Azenith, vppon which the degrée of the Sunne shall fall, doth shew to thée the Zenith of the Sunne, that is to say, his distaunce from the beginning of some fourth part, if it be distaunt at least, and it must nédes bee that such a Zenith bee in some fourth part Meridian, Orientall, or some Septentriall Occidentall: you must deale so with fixed Stars, placed in the Nette. But if the Center of the Sunne, or the toppe of the Starre shall happen in the distaunce of 2. Azenith: deale for the knowing the degrée of distaunce, eyther by estimation, as we often dw, or by deuision of the space into 10. degrées, as you haue learned by the rules going before.

❧ The 18. Chapter doth teache, how one fixed Starre beeing knowne of the Aranea, the knowledge of other vnknowne, is to be enquired.

IF some fixed Starre placed in the Aranea shall be knowne to thee, by the same thou shalt know any other vnknowne to thée described in the Aranea. after thys maner. In a cléere night, marke ỹ height of the starre knowne to thee, then put the toppe of it vpon the height marked betwéene the Almincarath, by accounting from the East or West, according as you shall sée it placed in the firmament, which done. Sée straight the starre vnknowne, placed in the Nette, and consider his height betwéene the Almincarath, & marke in what part of the worlde it shall fall, place the Inder vpon the equall Altitude, in the backe of the Astrolab, and turne thée to that part of the world, into which the vnknowne starre did fall, and the greatest and cléerest starre which you shall sée thorow the holes of the Tables, is the same which you séeke for. The matter is plaine, it néedeth no example.

¶ The 19. Chapter doth teach to come artificially to the knowledge of the Stars of the eight Orb, being vnknown.

WHat can be more pleasaunt, or delightfull to our eyes, then the order and viewe of those so manie great

lights, moſt ſæmely and comely, for if wee bee drawne thether by deſire, we ſhall trye, we haue felt nothing more delectable in this life. Wherefore if you haue knowledge of no fixed ſtarre, and you ſhall wyſhe to haue knowledge of them in the heauen, goe to worke after this manner. Marke the houre of the night by ſome Clock well corrected, to the which howre, apply the degrée of the Sunne in the Nette: which done, looke what ſtarre ſhall fall vpon the ryſing Horiſon, ỹ ſtarre, whoſe knowledge you did ſéke for, doth ariſe at ỹ time, and what ſtarre ſhal fall vpon ỹ riſing Horiſon, it doth fall then. And that you may perceiue the matter more plainelie, conſider in what houre of the night, the ſtarre which you ſéke to know, doth come to the Orientall Horiſon, further marke the Zenith of the ryſing of the ſtarre, and the number betwéene the Azimuth and the fourth part, in which the ſtarre doth riſe, which had, put the Aſtrolab according to the 4. partes of ỹ world, and apply the Inder to the degrée of the ryſing in that fourth part in which you haue found the ſtarre, & when you iudge the time of the ryſing of the ſtarre to bee at hand, looke thorowe the holes of the Tables, and the beames of the ſtarre aryſing, falling vppon thy eye thorowe the holes of the Tables, wyll ſhowe the knowledge of the Starre propounded. The like operation is of the falling of the Starre, and eaſier, whẽ as you ſhall bring it to apply it ſelfe to the holes of the Tables, ſtaying vpon the Horiſon, and about to fall, whereby hys knowledge ſhall be eaſier gotten: therefore the knowledge of ſome ſtarres béeing had by the manner of thys inſtruction, you ſhall be brought by a little and a little, by the doctrine ſpoken, into the knowledge of all the ſtarres deſcribed in the Nette, and in theſe, practiſe wil make thee a cunning workman.

¶ The 20. Chapter of numbring the aſcention or deſcention, in a right Sphere of one ſigne of the Zodiack or more.

IF therefore you deſire onely to know the aſcention of one ſigne in a direct Circle, ſette the begining of the ſigne on the line of the right Horiſon, in the Orientall part, and the Inder béeing put to, make a marke in the degrées of the Limb: then moove the Nette: ſo that the Inder may firmely cleaue to the beginning of the ſigne, vntill the ende of the ſigne fal on the ſame line of the right Horiſon, and againe at the breaſt as it were of the Inder, make a marke in the degrées of the Limb, then reckon the degrées, which are contained betwéene the two markes: for ſo manie degrées, as you gathered by account, do aſcend from the æquator, with ſuch a ſigne in the right Horiſon, which degrées, are named the aſcention or riſing therof, which if you ſhall deuide by 15. houres, you ſhall multiply the reſidue by 4. You ſhall ſerche out the minutes of the houre, and you ſhall haue the houres and minutes in which the ſignes propounded do riſe in ỹ right Sphere. In the like manner you ſhall ſéeke out the aſcention of 2. 3. or more ſignes &c. The deſcention of a ſigne or ſignes, or portions of the Zodiacke in a right Circle, is like the aſcention: wherefore it is not néedefull to deliuer it by the way, how ſuch a diſcention may be reckned.

The

❧ The 21. Chapter of the right ascention of a degree of the Ecliptick of a Starre.

AND if you would know the ascentions of some degrée of the Ecliptick, or Zodiack, or some starre, place the degrée or toppe of the starre vpon the right Horison, rysing, and the Inder béeing ioyned to it, straight you shall behold a right ascention in the æquator, answering to this degrée propounded, or starre, which ascention is to be reckoned from the Vernall diuision, that is to say, from the beginning of Aries. But if at last you desire to number in the degrées of ỹ Limb, goe to worke as we haue appointed, moue the Inder to the vernall diuision, by setting a mark on ỹ degrées of ỹ Limb, after account ỹ degrées of ỹ right lyne of the Horison, vnto the marke made, and you shal haue your desire. Moreouer, the ascention right, of the degrée, and the descention of the starre is, as it is manifest aboue.

¶ The 22. Chapter, howe by the right ascention knowne of a starre, the bowe of the Ecliptick ascending with it, may be found.

THe Nette therefore standing vnuariable, for the right ascention of a starre, as it was declared, reckon the signes and degrées of the Zodiack, beginning from Aries, vnto the right Horison rysing, for these signes, and these degrées,

so many as you doo gather in number, doo make manifest the bowe of the Ecliptick ascending together.

¶ The 23. Chapter, dooth deliuer in fewe words, what signes doo ryse and fall rightly, and what signes doo ryse and fall crookedly in a right Sphere.

EXperience bæing had, by the doctrine going before, of the rising and falling of seuerall signes, you shall finde Aries, Taurus, Leo, Virgo, Libra, Scorpio, Aquarius, and Pisces, in a direct Circle to arise and descend crookedly, for the portion of the æquator of euery signe ascending and descending together, examined by it selfe, is lesse then 30. degrées. You shall affirme that Gemini, Cancer, Sagittarius, and Capricornus, to rise and fall rightly, because the portion of the æquator, answering to the rising and falling of thē, is greater then 30. degrées. For you shall gather by diligent examination, that signes opposed, and set against, haue equall ascentions and descentions.

¶ The 24. Chapter doth teach, to comprehend in fewe wordes, what signes do ryse rightly, in a crooked and oblique Sphere and what signes do arise and fall crookedly.

BY the doctrine procéding, marke the ascentions or rysings, and descentions, or fallinges of euerie signe, by

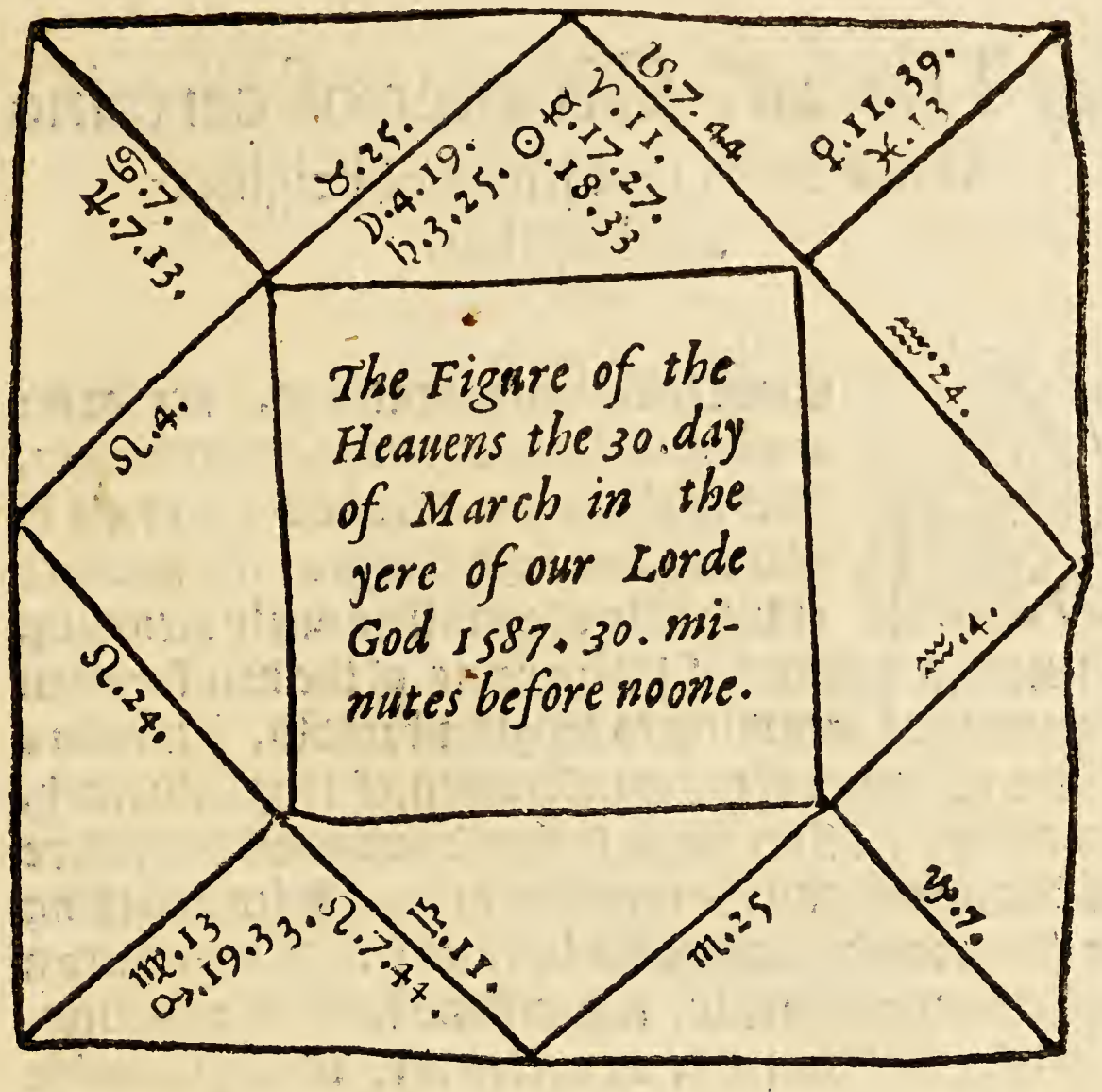
by experience you shall be more certaine. Suppose fiue signes to rise rightlie, and to fall crookedly, Cancer, Leo Virgo, Libra, Scorpio, and Sagietarius: for you shal find with euerie signe examined by it selfe, the portion of the æquator ascending together, to be greater then 30. degrées, and descending together, to be lesse then 30. degrées. Contrariwise, you shall say, that Capricornus, Aquarius, Pisces, Aries, Taurus, and Gemini, do aryse crokedly and stoping, and do fall rightly. Wherfore it is rightlie inferred that fiue signes in a croked Sphere rysing straightly, do fall crokedly, and that fiue rysing crokedly, do fall rightlie. Further it is concluded, the ascention of euerie signe, to be the descention of euerye signe set contrarie to it, and the descention of it, to be the ascention of the signe set ouer against it.

The 25. Chapter, of the finding of the beginninges of the 12. houses of the Heauens, for diuers Astronomicall iudgments.

I Wyll leaue in this place, the manner of the erecting of the figure of 12. houses of the Heauen, which the ancient cunning Astronomers haue obserued, and wyll sette downe a new way, of George Purback, and Iohn of the Kinges Mount, which they prowue by most strong reasons, and affirme to bee truer then all. Wherefore they called it the way of reason, for the knowledge of which, there are foure bowes

made in our Astrolab, passing thorow by the intersectiõ of the Oblique Horison, and line of the mid night, which foure bowes together, with the oblique Horison, and the Diametrall line going from the ring by the Center of the Astrolab, into the contrarie part (shewing a Meridian circle) we distribute the whole Heauen into 12. partes which we call houses. The Oblique Horison therefore, in the Orientall part, doth manifest to vs the beginning of the first house, and the degrée ascending. Then the bow folowing, going thorow the Horison mentioned, or the Angle of the Earth, towarde the lyne of the midnight, dooth open the beginning of the second house. And againe the other folowing, doth declare the beginning of the third house. But the lyne of the midnight doth serue to the beginning of the fourth house, and the bowe following toward the right hande, doth begin the fifte house, and so consequently you must goe forward, vnto the bowe of the 12. house, and there are alwaies fyre houses vnder the earth or Horison, that is, the 1.2.3.4.5.6. the other fyre are aboue the Horison, that is, the 7.8.9.10.11.12. and by this way with greate facilitie, and almost without labour, you may order the 12. houses, to euerie time offered, present, past, or to come, by example you shall perceiue it cléerelie. A certaine childe was borne, Anno. Domini. 1587. the 30. day of Marche, 30. minutes before none. I am commaunded to erect a figure at that time of the Heauens. First I find the Sunne in the 18. degrée of Aries, which I marke in the degrées of the Nette, and by the Ruler ioyned to it, I apply the same degrée in the 30. minute before none in equal houres: which done, I sée straight in the bowes and lynes of the 12. houses, the beginnings of all the houses according to order, which thinges I do set downe in a figure after this manner.

Consi-



Consider notwithstanding, that 6. houses béeing knowne as farre as their beginnings, the other 6. are knowne most easily by a Diametrall opposition, for the 7. house is opposed to the first, the 8. to the second, the 9 to the 3. the 10. to the 4. the 11. to the fift, the 12. to the first. To these houses, sette downe the true places of the Planets by the Ephemerides, and also the fixed clérer starres, and those of most power, and so by the examples of the heauen sette downe, you shalbe easilie enformed

The 26. Chapter of certaine Geometricall measures, of heightes and lengthes.

Cometricall mensurations, are for the most part occupied about three thinges, that is about the measure of heyght of playnes, and fired thinges: the measure of height is of quantitie onely according to length, ỹ measure of Playnes, is of the mensuration of quantities according to length & breadth, ỹ measure of fired things, is of the mensuration, of length, breadth, and depth, therefore the first mensuration doth measure the line, the second the couering or superficies of ỹ thing the third, dooth measure the body of it. To measure a quantitie therefore, is, to find some notable quantitie, or howe great the part, or partes are, of some notable quantitie. Those quantities are notable, which are vsuall among all or manie. As the finger, palme, foote, cubit, pase, race, myle, a measure called Alenca, and such like. A finger is the least quantitie, which measure they vsed heretofore in measuring fieldes, containing foure graynes of Barley, in length disposed méeting together in this wise maketh a finger. A finger. A Palme hath 4. fingers, as one finger, 2. fingers, 3. fingers. 4. fingers. The Palme.

A foote hath 4. Palmes.

A Cubit hath one Palme with a halfe.

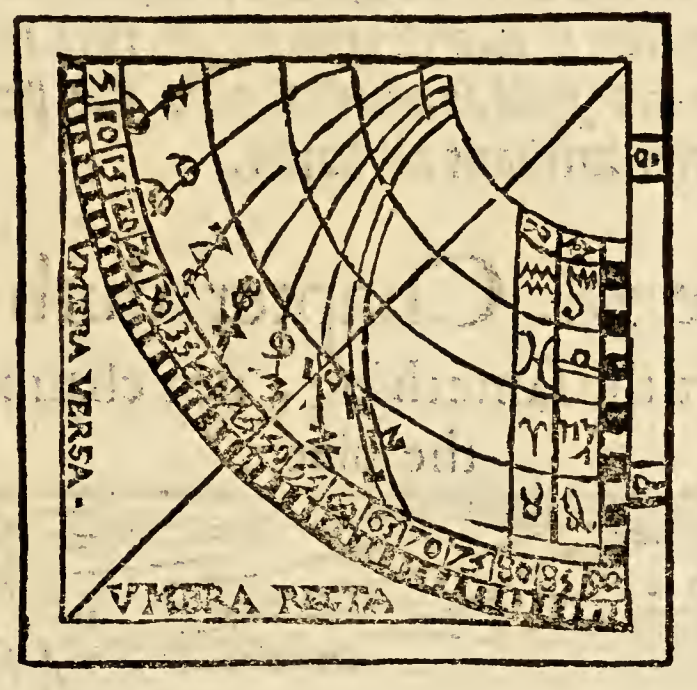
A pace hath 5. fæte.

A pertick or measure of 10. foote, or a beame is a long rodde containing 10. fæte.

A race hath 125. pases, of miles it pertaineth not to the purpose, because our sight can not reache so farre.

The

The 27. Chapter, doth teache to find out the height of any thing eleuated, that may become to be placed in an euen plaine without any ſhadow, by the Aſtrolab or Quadran.



ARiſtotle, the Father of Philoſophers, in the ſeaueth booke of his Topicks, hath forbidden vs to doe that in many words, which may be diſpatched in few. Let vs ſpeake therefore in this place, by what meanes the height of a thing to be gone vnto, into a plain, is to be found without ſhadow. Place therefore the Inder, according to the line in the middle of the Quadrant, or Lather (that is to ſay, vpon the lyne of ỹ middle ſhadow, or the 45. degrée in the Quadrant) of the fourth height, which is all one, and the Aſtrolab béeing lifted vppe, and hanged vpon your hand, ſo long moue thy ſelfe forward and backwarde, to the height

of the thing to be measured, vntill the visuall lyne going thorow both the holes of the pynnes ow méete, with the toppe of the thing, that is, vntill you sée the toppe of the thing thorow the hole of both the Tables, which being found, measure the space which is from the middle of thy foote, vnto the roote of the thing elevated, ỹ quantitie of your stature béeing added also, from the playne of the earth to the sight of the eye, which alwayes thou shalt cast behinde thée, and how much this quantitie is, béeing made so equall, so much shalbe the height of the thing elevated without all doubt.

The 28. Chapter doth teache to trye the same thing, not chaunging the place.

If you would ow the same thing, not stirring thy foote, goe to worke this way, take the Astrolab, and that béeing lifted vp toward the height, by mouing the Mediclinium, called the Index, belonging

ing to the Astrolab, you shall make it fitte, vntill you see the top of the height thorowe both ỹ holes of ỹ Tables, then if the line of trust shall fal vppon the side of ỹ right shadow, it signifieth ỹ the height of the thing is greater then the space which is betweene the rote & the height, and the middle of thy fote, and in what proportion 12. are to those poyntes, which the rule doth cut of, in the same proportion is the height of the thing, to the space betweene thée and it, the quantitie of thy stature béeing added as we haue admonished aboue, and it is put in practise so. Kéepe the number of the right poyntes cutte of by the lyne of the Ruler, then measure the space which is betweene the rote of the height of the thing to be measured, and thy fote by some measure knowne to thée, as by fote or paces. &c. and multiply them by 12. and let the production or number procéeding, be deuided by the number of the poyntes aboue kept, and that which shal goe from the diuision, shalbe the height of the thing the quantity of stature béeing added. For erample sake, if the height of b. c. be to be measured, the space from the rote of the height to my fote c. d. is 5. pases, the stature d. e. is 2. paces, the poyntes of the Lather of the right shadow touched of the Inder, are 6. I multiply the space of 5. paces by 12. and I bring forth 60. which I deuide by 6. right poynts, and I haue 10. paces, to which I adde the stature of 2. paces, and I gather 12. paces. I conclude therefore, the height propounded to haue 12. pases. But if the lyne of trust shall fall vppon the side of the shaddow turned, then the space betweene thée, and the foundation of the thing eleuated, is wyth thy stature, greater then the height of the thing eleuated, and in what proportion the poyntes are cutte off by the lyne of the Ruler to 12. in the same is the heyght of the thing to be measured, to the space betweene thée, and

the rote of the height of the thing, thy ſtature alwayes added. Of this part this is the practiſe, kéepe to ỳ parte the poynts of the ſhadowe turned, made manifeſt by the lyne of truſt, then meaſure the diſtaunce betwéene thée and the rote of the thing to be meaſured, by ſome meaſure knowne to thée, and multiply the ſame by the poyntes of the turned ſhadowe aboue marked, and that which procéedeth forth, deuide it by 12. and thou ſhalt haue in the ſame, the height of the thing, the quantitie of thy ſtature béeing added, the matter is playne, it néedeth no example.

The 29. Chapter, howe the height of a thing, not to bee gone vnto, ſtanding in a perpendicular plaine, is to be knowne.

But if peraduenture flowdes, dytches, or valleye, ſhall bee a hinderaunce betwéene the foote of the meaſure, and the rote of the thing to be meaſured, by this manner you may finde the meaſure of the length purpoſed. In this playne, the Aſtrolab béeing lifted vp, diſpoſe the Inder ouer againſt the top of the thing to be meaſured, vntill you may ſée the toppe thorow both the holes of the Tables, and conſider warily, vpon what ſide of the ſhadow the line of truſt doth fall, which if it fall vpon the ſide of the turned ſhadow, marke how many poyntes the line of

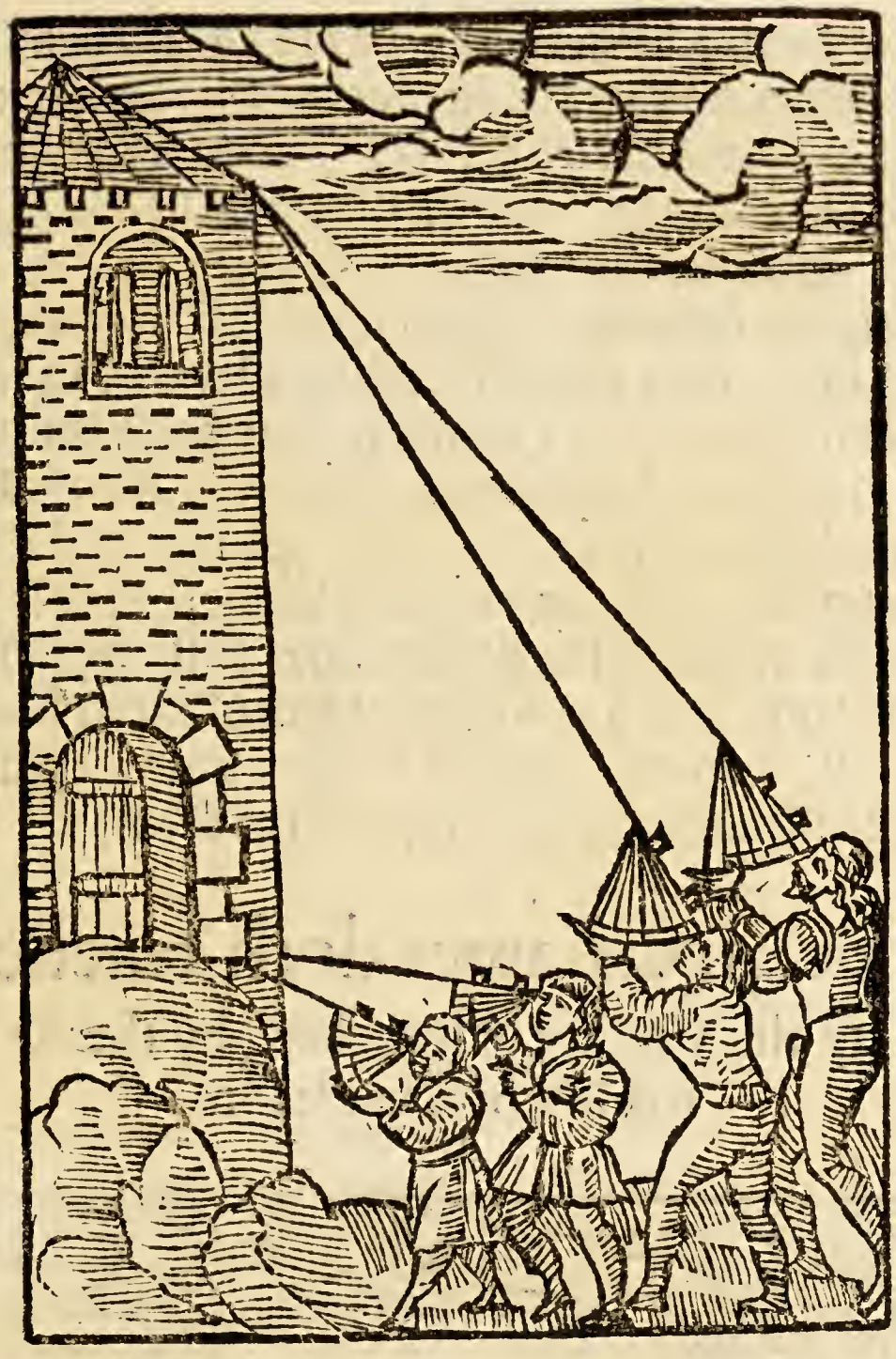
of the Ruler doth cut off, and deuide 12. by the number of the poyntes, and kæpe the ſumme. After the place being marked in which you ſtode, goe backwarde or forward a little from the firſt place, and in the ſecond place lift vp the Aſtrolab againe, and againe loke to the top of the thing, by the holes of the Tables, and conſider the number of the points cut of by the lyne of truſt, by which number deuide againe by 12. and then ſubſtract the ſumme, comming from the firſt ſumme before ſette downe, if it ſhall be leſſer or otherwiſe, and kæpe the exceſſe or ouerplus. For example ſake. The line of truſt doth fall in the ſecond ſtation vpon 6. poyntes, deuide them by 12. and thou haſt in the ſumme 2. which ſubſtracted from the former, 4. bæing kept, the ouerplus is 2. which ouerplus kæpe. After meaſure ỹ ſpace betwéene the two ſtations or places, with what meaſure you will, and deuide the number of that meaſure by the ouerplus before kept, that is 2. and the number which ſhall come from the deuiſion, thy length bæing added, will declare that thou ſéekeſt: An example. If the number of thy ſpace be 40. féete, then by deuiding 40. by 2. which are the ouerplus, there commeth forth in the ſumme 20. féete, which are part of ỹ height of the thing, to which adde the ſtature of the meaſurer, which I put caſe to be 7. féete, and ỹ ſhalt gather 27 féete being the height of the thing eleuated, and of theſe thinges a generall rule is inferred, that ſubſtraction bæing made of the ſummes aboue kept, taken from the poynts of the ſhadow turned, founde in the two ſtations. If for the ouerplus there ſhall remaine 1. the ſpace of the ſtations ſhall be equall to the height of the thing to be meaſured, the ſtature of the meaſurer bæing added, as wée haue often times ſayd, if there remayne two it ſhall be double, if thrée, it ſhall be triple. &c.

The Trauailers ioy

The Figure belonging to the Chapter aforesaide.

The 30. Chapter dooth teache the height of a thing erected vpon a hyll, of which height, the lower ende and top are seene, the eye beeing in a vallye to measure it.

Now



NOwe it resteth to show howe the measure of any height in a high place, (put case a Hyll may be comprehended of vs in a lowe place, put case a Vallie) this seemeth to bee hard, but reason searcheth euery way of nature. Euery thing therefore, which rysing from ỹ vppermost part of the

earth is carried vpward, and the top béeing eleuated on high, dooth passe ouer the euennes of the playn lying about it, is height, which height, if sometimes from an vnlike place it mæte with Vallies and hylles in measuring. First, let the measurer séeke out in ỹ low place or Vally the naturall Horison, of his station or place, that is, some thing which hath some playnes, equall distant to the Horison, in which he may finish the worke of his measuring, which béeing founde, let him first consider the height of the hyll by two places or stations, according to the instruction going before, then let him marke the height of the Towre and hyll together by the same instruction, and then let him substract ỹ height of the hill, from the height of ỹ whole added togeather, and the residue shalbe the height of the Towre.

¶ The 31. Chapter doth teache to try the measure of lengthes, by the Astrolab or Quadrant.

Know.

KNowledge bæing hadde of thinges spoken of the height of thinges standing perpendicular or stooping forward, you shall easily vnderstande these fewe thinges of ẏ measuring of Playnes according to the length which we haue sette downe. For thou hast learned by the length knowne, the height vnknowne, bére contrariwise by the height knowne, you shall knowe the length vnknowne of the Plaine. When therefore you would measure a Plaine, whose ende is seene, whether it be to be come vnto or no, according to the length, by the office of the Astrolab or Quadrant. First of all dispose the measuring Rodde, which in any case must be the same length, as thy stature is of from the eye to the foote, which rodde deuide by some measure knowne to thée, and the best deuision of it, is into 12. equall partes, which bæing disposed, stand in one ende of the Plaine according to the length to be measured, and the Astrolab bæing hanged vp, heaue vppe or put downe the Inder, vntill you sée by ẏ holes of bothe the Tables, the other limit or ende of the Plaine, on the ouerthwart part, which séene, reckon diligently the poyntes cut off by the lyne of truste, which are almost alwayes the poyntes of ẏ turned shaddow, for then the length of the Plaine is greater then the rodde of ẏ measurer: by the poyntes therefore cut of aboue found out, deuide 12. and the number accounted will declare to thée of what quantitie the part of the measuring rodde is, in respect of the length of the Plaine which is measured, for if the line of truste shall fall iustly vppon the

lyne of the middle shadow, that is, vppon the diameter of the Quadrant, the length of the Plaine shal be equal to the rodde of the measurer, but if the Ruler shall fall vpon the 11. poynt of the turned shadowe, the length of the Rodde once taken, with the eleuenth part thereof shalbe the length of the Plaine. If it fall vppon the 10. poynt of the shadow turned, the length of the rodde once taken, with two 10. partes of the rodde, shalbe ỹ length of the space of the Plaine. If furthermore the line shal fall vpon 9. poynts of the shadow turned, the length of the rodde once taken, with thrée nine parts of the same rodde, shall be the measure of the length. If the lyne of truste shall fall vpon 8. poyntes of the turned shadow, the length of the rodde once taken with halfe of it, shalbe the measure of the length of the Plaine. If it fall vpon 7. poyntes, the rodde is the length with 5. seauen partes, if it fall vpon 6. poyntes, the rodde twyse taken doth finish the thing sought for. If it fall vppon 5. poyntes, you shall haue two roddes, and two 5. partes. If it fall vpon 4. poyntes, you shall haue iuste 3. roddes, if it fall vppon 3. poynts you shall haue 4. roddes. if it fall vpon 2. poynts, you shall haue 6. roddes. At laste, if the lyne of truste shall fall vpon the firste poynt of the turned shadow, it is signified, that the space of the length is in a twelue folde proportion to the rodde. Wherefore if at laste you take the rodde twelue times, you shall gather the length of the plaine.

The 32. Chapter and the laſte, of meaſuring depth.

LEt the meaſurer of ẏ depth, firſt know the quantitie of the Diameter or breadth of the Well, which being knowne, the Aſtrolab beeing hanged vppe, let hym applye the Inder to the mouth or vppermoſt part of the Well, or depth to be meaſured, and let him moue the ſame by lifting vppe, and putting downe vntill you ſhall ſee by the holes of bothe the Tables, the ende of the depth of the Well, of the ſide oueragainſte him, from that ſide in which hee ſtandeth, ſo that at one ſight, he may ſée the vpper ende of the Well, and the lower ſette againſt it, which done, if the lyne of truſte ſhall fall vpon the line of the middle ſhaddowe, the depth ſhalbe equall to the breadth of the Well, but if

the lyne (as for the moſt part it alwayes happeneth) ſhall fall vppon the poyntes of the right ſhaddowe, the depth is greater then the laugth. Conſider therefore the number of the poynts, then meaſure the Diameter of the breadth of the Well with ſome meaſure knowne to thée, and multiply the ſame meaſure by 12. and ỹ ſumme by the number of the poyntes found out of the ſhadowe and the whole ſumme doth ſhowe the depth of ỹ Well, or otherwiſe more eaſie. By the number of the poyntes found out deuide 12. & the number receiued doth ſhow readily, how often you ought to receiue the breadth of the Well for the depth thereof. And after this maner deale in al other, euen ſo with the Diameter of ỹ Well, as wee haue appoynted with the meaſuring rodde.

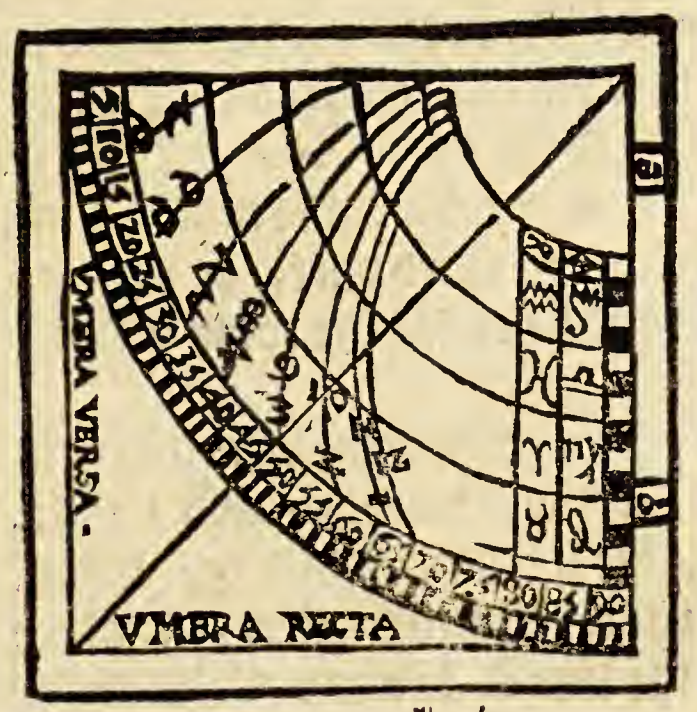
The Concluſion.

INfinite are as yet the commodities of the Aſtrolab, wherefore we haue brought in but a fewe ſlight thinges for inſtruction ſake, but vſe and diligent exerciſe will ſhow greater thinges to thée, vſe it therefore, and truely you wyll finde ioy.

THE COM-

position and framing of the *Quadrant.*

THat the Quadrant may bee truelie framed, you must knowe, that euerie celestiall Sphere, or celestiall circle, is supposed to haue 360. equall partes, as of the 12. degrées of the signes of the Zodiack, the Zodiack himselfe is supposed to haue 12. times 30. degres. If therfore ỹ Sphere or Circle be deuided into 4. equall partes, euery equall part is called a Quadrant, and hath portions of 30. former parts.



A Quadrant therefore is so framed, the fourth part of a Circle perfect being receiued, let a straight lyne be drawne, about both the sections, and they wyl deuide themselues in the top and creft of the Quadrant, which intersection, is thought to be the Center, and to ỹ same let be ascribed A. and to the ende of the line toward the right hand, let be ascribed B. at the left hand C. the fote therefore of the Compasse standing vnmouable in the poynt of A. let seauen lines be drawne. D.B. to C. bee-ing a little distant, of which lynes, the 3. higher partes for the Limb of ỹ Quadrant w̃ spaces intermingled, in the 18. respect of the center, are deuided with little lines drawne, and there ariseth 18. spaces betwéne euerie two little lines which are brought about: euery thing of the lower partes is deuided into 5. and to euery one of the higher, by beginning from C. let one number bee giuen from 5. to 90. making progression by numbers standing on 5. and the Limb is perfect, and the line cut-ting of the 45. degrée toward the Center must be con-tinued, and is called the measure of height.

Let the space vnder the Limbe, next to the 25. de-grée and a halfe also, to the 66. degrée and a halfe, be cut off. Let the first part be coloured euer with red colour, and marked with the fierie Zone, let the seconde parte be dyed with grécne colour, and marked with the tem-perate Zone, let the third part, be painted with a wa-trish coloure, and be called the colde Zone.

Let the space next to this, be deuided in the degrées following, 1. 2. and a halfe. 20. and a halfe. 27. and 40. minutes, 33. and a halfe. 38. and 35. minutes, 43. and one twelfth part. 48. and a halfe. 65. also 61. to which spaces from the line B. toward C. let the names of the

Climats

Climats be written in this order.

Dia Meroes, Dia Syenes, Dia Alexandrias, Dia Rhodu, Dia Rhomes, Dia Boristhenes, Dia Rhypheos, Dia Thyles.

Let the next space be deuided alone, in euery tenth of the degrées, and the 10. lines of these described in the Wappe of the worlde, shall signifie the Parallely reaching to the length of the earth, from the East to the West, and let the number following be written down, by the order, béing the miles aunswering to one degrée in such a Parrallely, which are taken frõ ỹ South toward the Poles, 60. 59. 54. 50. 47. 40. 32. and 28. in one space, by deuiding it in the middle, so 26. and 20. in the next, likewise 21. and 6. in the last.

The length of dayes according to the Parallely of Ptolemie, are thus sette downe.

LEt the néerest space be deuided in these degrées following, that is, 4. and 15. minutes, 8 and 25 minutes, 12. and 30 minutes, 16 and 25 minutes. 20 and 15. minutes, 23 and 50 minutes, 27 and 40 minutes, 30 and 20 minutes, 33 and 20 minutes, 36. 38. and 35 minutes, 40 and 55 minutes, 43 and 5 minutes, 45. 48. and 30 minutes, 51 and 30 minutes, 54, 56, 58, 61, 63. and these béeing so disposed, there aryseth 12. Parallely of Ptolemie, and to the first space is inscribed the twelfth part, because the day vnder the æquator is of 12 houres, in other it alwayes increaseth by the quartal of the houre, which, if it pleaseth may bee noted out hereby, that it may be done moze cunningly.

Let there be framed two holes in the section A.B. finelie bored to the right line.

Let the circumferentall line be made from the Center to the distaunce of the breadth of two fingers, and beneth the circle squared with the line B. C. and let the Tryliniall line be more inward then the gymme, let euery part be deuided into 12. equall partes, or as many as they may haue, and let them bee marked in the higher by the numbers, in the lower by the vnities, ỹ rygbt line clyming to the holes, turned to the other line is called the shaddow, 12. are alwayes put to the line that measureth height.

In the Center let there be put a threedde, with two Pearles or round Beades for your Wargge to meue vppe and downe, a Plumett put to, in the end, to make the threedde hang straight.

Let the length of the line be taken warily, which is found in the body betwéne the 2. next circumferentall lynes, and let a Circle be made by it, of some other matter, from hence let euery middle part bee deuided, from that line béeing as the Diameter, into 6. equall partes, and let lines be made, from poynt to poynt, beeing turned, and there commeth forth 5. lynes, from hence by descending by the *Diameter*, let the distaunces of the lynes, deuiding the Diameter be taken, and let those distaunces be marked by the poyntes in the lyne A.C. and from those poyntes, the foote standing sure and vnmouable, let lines be drawne in the Center to ỹ lyne A. C. and let Aries be written vpon the line enclosed, betwéne the two broader spaces, to the higher lyne, Taurus to the third, Gemini to the highest, Cancer, to

the

the next descending Leo, to the other Virgo, to Arics Libra, to the next Scorpio, to the other Sagittarius, to the lowest, Capricornus, to the next ascending, Aquarius, to the other Pisces.

Let euery space betwéene these lynes, in the line about A. B. be deuided into so manie partes as may conuenientlie be had signifying 30. degrées.

Let the lyne A. C. betwéene the line of Cancer and Capricornus, be deuided into so manie partes equall, so manie houres as longest and shortest dayes do differ, and if you do deuide it againe into 4. you shal haue the quarters of houres.

If from euerie fift tenne degrées of the Limb, by respect of the Center, toward the line of Cancer, you shal drawe crooked lynes, the Center béeing sought within or without the Quadrant, thou hast drawne the lines of vnequall houres.

But for the lynes of equall houres, take in ỹ Limb of the æquator the eleuation of thy Region, and putte a point in the line of Aries, vpon which line ascend in the Limb to 23. degrées and a halfe, and put a poynt in the line of Cancer, from hence descend vnder the poynt of the æquator, to so many degrées and set a marke on the poynt in the line of Capricornus, loke for the Center without the Quadrant, and when you touch these 3. poyntes, drawe a lyne which shalbe 12. in thy Region, for other Regions drawe lines in respect with this Figure, which is of valor, at London.

Houres. 12. 1. 2. 3. 4. 5. 6. 7. 8.
Of the day. 12. 11. 10. 9. 8, 7. 6. 5. 4.
Cancer. 62. 60. 54. 46. 37. 28. 18. 9. 1.
Æquator. 38. 37. 33. 26. 16. 9. 0.
Capricornus. 16. 14. 6. 0.

This figure is corrected, not by regarding a fewe minutes, of which 60. make a degrée.

Of thinges which are knowne by *the Quadrant.*

If the pearle be put to the degrée of the signe of the day appointed, the lyne is manifest both by the numbers of the houres of the day, and by the light of the Sunne pearcing thorow the holes, the pearle doth show the equal and vnequall houres, and perpendickle or the hanging downe in the Limb, doth declare the eleuation of the Sunne vpon the Horison, the pearle doth showe the signe, and the degrée of the signe. Likewise, while the Mone or starre is séene thorow the holes, the threedde doth cutte of his eleuation vpon the Horison in the Limb. The Attenta in the line A. C. the poyntes béeing distaunt from the æquator, the stone of the Sunne doth showe the declyning from the Equinoctiall, the Sunne as abone pearcing thorow the holes, and the threedde touching the lyne measuring height, or the 45 degrée, euery thing is equall to his shadow. If it fall toward B. then the thing is longer then the shadow, if to C. it is shor-

ter

ter vnder that proportion, if it fall in the 12 poynt of the Lather in the shadow, and let one be cast awaie, the resdoue is the height, if in the tenne poynt, the shadowe is longer in the sixt part: if in the 9. poynt, the shaddowe is longer in the fourth part, if in the 8. point, the shaddow is longer in the third part, if in the 7. poynt, the shadow is longer in the 5. part, let the distaunce be deuided into 12. and let 5. be cast away, if in the sixt point, the middle of the shaddow is the length, if in ỹ 5. poynt let the shadow be deuided into 12 partes, and let 5. bee cast away, if in the fourth point, the fourth part of the shadow doth giue the height, if in the third point, the fourth part of the shadow doth shewe the height, the same is knowne. If any man haue taken the height of a thing by sight, by the windowes of the holes, and shall account the distaunce for the shadowe, this obserued, that alwaies the height be added from the earth to the eye, if it be donne by sight, after the same manner, wee must say of the poynts of the right shadow, this obserued, that as heere is an ouerplus, and a casting away, so there is a wanting, and therefore must be an addition made.

The playnenes is taken, if you apply the toppe or crest, to your eye with the left hand, and do see the ende of the thing to be measured by the holes, the poynts wil show the deuider of the turned shadow, heere being the height of the eye by 12. to the earth, after deuide, and it is playne.

If by loking on the ground, the poynts of the right shadow cut off by the perpendickle, are receiued for the deuision, and the Diameter is multiplied by 12. the quotian of the deuision doth shewe the length.

The Trauailers ioy

Euery degrée from the æquator turned to the Artick Pole, hath threéscore English miles aunswering to it, but from the East and West they are otherwise taken, vnder and about the æquator also threéscore, but rather by declyning there are fewer degrées, as appeareth in the Limb of the Quadrant.

The framing of the *Sphere*.

H that is about to frame a Materiall Sphere, let him first make two circles to the straight Angles of ỳ Sphere, deuiding themselues, then let him make fitte the Axle trée, then the æquator with both the Tropicks, and make the æquator in the middest, the Tropicks distaunt from the æquator 23. degrées, and 51. minutes, but heere it must be noted, when you shall deuide euery circle into foure equall partes, that there are 90. degrées in euery fourth part, according to this, you must deuide all the spaces in the Circles. The reason of the deuiding of the 4. parte, for if you will deuide any fourth part, first deuide it into three equall partes, then againe deuide those partes into three equall partes, and againe deuide euery parte of them into 10. and in euery fourth part, there wyll come vppe 90. degrées, of these you may either take away, or adde to them. When the Tropicks are added,

place

place the Artick and the Antartick circles, béeing also distant from the Poles 23.degrées,and the 51. minutes, almost the Zodiack, so from one Tropick to the other, that the Ecliptick may touch them both, but let it deuid the æquator vpon ỹ colure or tayle of the equinoctials, let it come néere to the Poles,vppon the colure or tayle of the Solsticicie,then let the Meridian and Horison bee made according to their descriptions.

To make a Triangle béeing of equall sides, vnderstand thou,if they be framed,thorow whose Angles the one béeing put to thy eye,the other closed fast,thou shalt sée the outward parts of the thing to be measured, thy distaunce doth shewe the height.

If thou shalt bore thorow a staffe in some part of it, by thrée holes equall distaunce, and shall make fitte a sticke of one distaunce of length to the holes, then haste thou made a Iacobs staffe, if thou sée the outward parts of the thinge to bee measured by the outwarde partes of this sticke,the hole béeing put in the middle, sette a marke on the place. After,put it to the next hole backward if you will goe to it forward, if you will go backward, while you sée the extreame part againe,for so the space of the distaunces do show that which you séeke. So by the Lather,and Limb,the lengthes,& heights,&c. And the eleuations are taken by the same way in the Astrolab.

The Cilinder is deuided into equall partes in hys circumference , the other 12. partes do aunswere to monethes and signes : if you put the tongue to ỹ day of the moneth,it wyll declare the houres of the day.

In like sort,if you put the tongue of the Noctulab to the greater starre of the greater Beare, and shall put

the mouing whéele to the day which you vse, the Pole bæing séene thorow the Center, the little tongue in the mouing whéele doth show the houre of a naturall day.

If you make a circle, and shall place the halfe Diameter truely, you may know ỹ proportion of all things at his shadow, as the shadow is framed to the circumference, what proportion may be signed by their manner.

The space betwéene the thumbe and the nert finger applyed to the line of life, that is, so, that the little finger may respect the lowest ioynture in the eleuation, doth shew the houres in the ioyntures of the hande and fift finger, and with the nayles of the other fingers, so that the ioynture of the hand doth showe 12. houres, the other ioyntures in their respect, dow shew other houres.

As the shadow of a rodde of knowne length, is affected to his owne shadow, the same proportion is in others, or if any rodde be erected vppe, and the measurer placed on the backe sée the toppe of the thing, the distaunce of the eye from the foote doth showe the height, the like of the eye applyed to the earth.

How often the ende of the plaine bæing séene, part of the hinder rodde cutte off, vppon the visuall poynt, by the first part of the same length, is contayned betwæne the two rods, so often ỹ whole rod is in length.

If the Diameter be applyed to a Well or vessell by the length, and a little visuall rod be marked by the rod cut off in the rod lying, the depth bæing séene in ỹ parte opposed, how often a little rod is contained from the visuall poynt of the sight in the rod lying on the opposed part, so often the rod lying is in the depth.

Of

OF THE RE-GIONS AND CIT-ties, subiect to the Signes and Pla-nets, and first of those that be vnder *Aries* and *Mars*.

♈ ♂ BAsternia, *Syria*, Palestina, *Englande*, *Fraunce*, *Germanie*, *Burgundia*, *Svveueland* : and of Citties with Townes, *Naples*, *Ancona*, *Ferraria*, *Florens*, *Verona*, *Capua*, *Lindauia*, *Cracouia*, &c.

Vnder Taurus and Venus.

♉ ♀ *Heluetia*, *Irelande*, *Cyclades*, Ilandes, *Asia*, *Cyprus* the lesser, *Media*, *Parthia* &c. Of Citties and Townes, *Lucerna*, Herbipolis, *Tigure*, *Posua*, *Bonony*.

Vnder Gemini and Mercurius.

♊ ☿ Hircania, Armenia, *Cyrene*, *Marmarica*, the lower *Egipt*, a part of *Lumbardie* *Flaunders*, and *Brabant*, and of Citties and Townes, *London*, *Louain*, Brigis, *Mence*, *Halsford*, *Norinberge*. &c.

Vnder Cancer and the Moone.

♋ ☽ *Numidia, Affrica, Bithinia, Carthage,* Phrigia, Holland, *Zeland, Scotlande,* the Kingdome of *Granat.&c.* And of Citties and Townes, *Constantinople, Venice, Pise, Millan, Treuers, Yorke, S. Andrewes, Lubeck.&c.*

Vnder Leo and the Sun.

♌ ☉ *Italie, Sicilie Apulie, Boheme,* Phœnicia, a parte of *Turkie, Sabina, &c.* & of Citties with Townes, *Damascus, Rome, Confluence, Rauenna, Cremona,* Prage.*&c.*

Vnder Virgo and Mercurius.

♍ ☿ *Mesopotamia,* Babilon, *Assiria, Greece, Achaia, Crete:* and with Citties and Townes, Hierusalem, *Corinth, Rhodes,* Papia, *Toloſe, Lions,* Paris, Heydelberge, *Basile.*

Vnder Libra and Venus.

♎ ♀ *Bactriana, Caspia, Thebaida, Ethiopia, Lyuonia Austrige, Oasis,* and of Citties and Townes, *Caieta, Lauda, Suessa,* Placentia, *Friburge,* Argentine, *Spiers, Franckford.&c.*

Vnder Scorpius and Mars.

♏ ♂ *Indæa, Capadocia, Getulia, Mauritania,* Norway, *Carthalonia,* and of Citties and Townes, *Valentia,* Padua, *Messana, Aquileia.&c.*

Vnder Sagittarius & Iupiter.

♐ ♃ *Spayne,* Arabia the happy, *Vngary, Slauonia Celtica, Misnia,* And of Citties and Townes, *Tolet,*

Tolet, Cullen, Narbona, Stutgardia, Rotenburge, Buda. &c.

Vnder Capricornus, and Saturnus.

♑ ♄ *India, Arriana, Macedonia, Thracia, Greece, Saxonie, Hessia, Orchney Ilandes, Machline, Oxforde, Brandenburge, Constantia, Fauetia, Augusta, Vindel, &c.*

Vnder Aquarius and Saturnus.

♒ ♄ *Arabiæ desert, great Tartaria, Denmark, Segdiana, Sarmatia, &c.* Of Citties. *Hamburge, Brema, Salisburge. &c.*

Vnder Pisces and Iupiter.

♓ ♃ *Lidia, Pamphylia, Calabria, Normandy, Portugal Sicilie,* and of Citties and Townes, *Alexandria, Hispalis, Compostel, Ratisbone, Wormes.*

BEfore we do procéede with Tables of Longitudes and Latitudes of Countries, and Regions, it behoueth you to know what measures we chiefely vse, as a pase, a furlong, a league, a myle, a degrée, &c. And the least measure to begin withall, is a Barley corne, and thrée Barley cornes out of the middle of the eare in thicknes, maketh an inche.

12. inches maketh a foote.
3. foote maketh a yarde.
5. quarters of a yarde, maketh an ell.
5. foote maketh a pace,
100. and 25. pases maketh a furlong.
8. furlongs maketh an English mile.

60. and 6. furlongs maketh a french league.

5. yardes and a halfe, maketh a perche or rodde to measure land by, the perche or rodde is 16. foote & a halfe long.

100. and 40. perches maketh an Aker. For as a mark of English money, containeth a hundred and 40. pence, so euerie Aker of land, containeth a 100. and 40. perches. And as a noble containeth 80. pence, so halfe an Aker of land containeth 80. perches, and as halfe a noble doth containe 40. pence, so a rodde of land doth containe 40. perches.

253440. Barley cornes will reache a mile, and 5473040000. Barley cornes, aunswer to 21600. myles the circuite of the earth.

16. foote and a halfe, maketh a perche, that is fiue yardes and a halfe, 600. foote, by fiue score to the hundred, maketh a hundreth, that is, 38. perches saue two foote. 8. furlonges maketh an English mile, that is, 5000. foote. So 300. and 3. perches, is an English simple. Now you know what measure is chiefely to be vsed, it is necessare also, that you shoulde vnderstande, what a degrée of Longitude & Latitude dooth containe. A Longitude is the length of a thing, and a Latitude is the widenes or breadth of the same. as for example.

The circuite or compasse of the earth, doth containe 360. degrées: and from the South Pole to the North, we call it the Latitude, and from the westernly Canary Ilandes to the East poynt we call that the Longitude, (next followeth what a degrée of Longitude and Latitude is, but before I procéede any further, it behoueth you to know some what of the Zodiack, that is to say, the great Circle in the *Mobilæ*, and marueilous Cittie of the firmament, for Ptholomie saith, that the Zodiack

of

of the Heauen, is a great Circle, sette and deuided in 8. or 9. Spheres of the firmament, the which Circles is deuided into 12. euen partes, and the Philosophers do call the 12. euen partes, the 12. signes. that is to say, Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagitta, Capricor. Aquari. and Pisces. And these signes doth showe vnto vs, in what part of the Heauen the Sunne, the Moone and the Planets be, in the 12. signes, by distincts & places. The lyke may be known of Philosophers, by notable starres, and euery signe is deuided into 30. degrées, and euerie degrée into 60. minutes, and euery minute into 60. secondes, and euery second into 60. thirds. Now multiply 12. times thirty, and it yéeldeth 360. degrées, and euery minute of a degrée, aunswereth a mile vpon the earth, and euery degrée 60. miles in Latitude. And the like in the Longitude in the East and West line. Nowe will I showe you how to finde out the Longitude and Latitude of anie two places, by the degrées in the Zodiack, as for example.

I take the eleuation of the North starre at Portsmouth, the which is the furdermost place of the South part of England, and I finde it 51. degrées, 20. minuts. In like sort at Twadmouth, the furdest place North in England, whose Latitude is 56. degrées 49. minutes, The difference of these two eleuations, is 5. degrées 29 minutes. Also the direct distaunce from Portsmouth to Twadmouth, is 329. miles, now deuiding the 329. (which is the portion of the earth, answering the difference of these two eleuations) by 5. degrées and 29 minutes, which is the difference, I finde the quotient to be 60. wherfore in all places in England, 60. myles aunswereth to one degrée of any great Circle in ỹ Heauen. The like prepositiõ may bee put betwéene any

two Cities and Townes, mencioned in the Tables of Longitudes and Latitudes, (ỹ difference of the degrées and minutes betwéene them) will declare howe many miles the one is distant from the other. And to measure the compasse of the whole earth how many miles it doth containe, you knowe that euery minute of a degrée aunswereth a mile, and euery degrée 60. miles, and if one minute of a degrée in the Zodiack, aunswereth a mile vpon the earth, what doth 360. degrées answer, I worke in Arithmatick in this wise, I multiply 360. degrées by 60. minutes, because thrée score minutes answereth a degrée, and euery degrée answereth 60. mile and it yéeldeth 21600. mile the whole Circute of the Earth, I wil moue vnto the ignorant and simple people an other question, that may séeme merueilous to them for lacke of knowledge and vnderstanding in Arithmaticke. The Sun by violence contrarie to his proper motion, is caried round about the Earth in 24. houres, I wold know how far he is caried in an houre, (you haue heard already ỹ 15. degrées maketh an houre) & euery minute yéeldeth a mile, & euery degrée 60. miles now I multiple 15. degrées by 60 minutes and it yéeldeth 900. I conclude, and say that the Sunne is caryed by the rauishment of the firmament, 900. miles in an houre. Then it séemeth that the Sunne, was caryed faster then an Arrowe could be shot out of a strong-bow. the which is merueilous in our expectation, because we can not sée him to moue so fast in our sight, the reason is because of his extreame height from vs.

An other proposition of the Sunnes motion, if the Sunne be caryed 900, miles in an houre, howe many miles is he caryed in 24. houres. I answer, I multiplie 900. miles by 24. houres, and it yéeldeth 21600. miles the Circute of the Earth in a day naturall.

An

¶ An other Question.

IF the Sunne be caryed 21600. miles in a day naturall, how many miles is the Peregrination about the earth, in 365. dayes and 6 houres, the which by most computations is a yéere, I worke in this wise, I multiplie 21600. miles the which the Sunne is carried in a day naturall, by 365. dayes and 6 houres, and it yéeldeth 7884000. then may I conclude and say, that so many miles, he hath compassed in going aboute the Circute of the earth in a yére.

An other question, and so I ende.

THere is from the creation of the world to this yére 1587. in yéres 5549. I would knowe howe manie times, the Sunne hath made his perigrination about the Circute of the Earth, and what number of miles in all these yéres, I worke in this order, I multiplie. 5549. by 365 daies and 6. houres, and it yéeldeth. 1925285 then may I conclude and say, that the Sunne hath compassed the Earth so many times since the beginning of the world. And the miles that the Sunne hath gonne in his Peregrination about the Earth, from the Creation of ỹ world till this yére 1587. is 43688316000 And in like manner did the famous King Alfonsus, Calculate his Astronomicall Tables, containing ỹ moving of the heauenly bodies, which haue their mouing by a double moouing, by their owne kinde out of the West to in the East, against the mouing of the firmament, and by other mooning out of the East into the West, and that by rauishing of the firmament, by violence of the firmament, they be rauished euery day out

of ẏ Eaſt into the Weſt, as before you haue heard how the Sunne is caryed euery 24. houres. Thus I haue ſhewed you the proportions of meaſures, the degrées of Longitudes and Latitudes, the degrées of the 12. ſignes in the Zodiacke, how many degrées anſwereth an houre, and what minutes an houre containeth, and how many miles vpon the Earth anſwereth a degrée, what number of miles the Circute of the earth containeth, and how to finde out the diſtaunce of miles, betwéene any two Citties or Townes, by the eleuation of the Northe ſtarre and Southe, with other pritie queſtions in Arithmatick, of the Sunnes Peregrination about the earth, both hourely, dailie and yerelie, very pleaſaunt for all ſortes of perſonnes, which are deſirous to recreate them ſelues in this delectable ſtudie. And now to proceéde forewardes how to direct a ſhippe, it behoueth the good Nauigator, not onely to haue knowledge in Mappes and Cardes, (but alſo) in the Mathematicall inſtruments, the vſe and working whereof is already at large declared, and for the readines in finding out of any place or places, knowen or vnknowē vnto them, in their Peregrinations or Trauels, I haue Collected and gathered out of Strabos, 2, and 17. booke, Plinius 8, booke, Ptolomæus workes, and other learned Authors which hath made obſeruations in many Countries. Tables of Longitudes and Latitudes, of Prouinces, Ilandes, Citties, Townes, Villages and hilles, both in Europe, Africa, Aſia, and ſome parte of America, and the firſt parte to beginne with all vnder Europe is Scotland, and as for the coaſtes of England and Ireland, I ouer paſſe them for diuers good conſiderations, I hope in God our Engliſh Nauigators and Saylors, are all ready Sufficientlie well inſtructed and acquainted with the ſame.

Of

Of Scotland.

The Chiefe Citties and Townes are theſe folowing.

The two firſt numbers ſhew the Longitude with his minuts. The two ſecond, ſhew the Latitude and his minutes.

S. Andzewes whoſe Longitude is 16 .degrées. 40 minutes. Latitude 57. 55. minutes.

Dun Baur 17.0.59.30
Dundie 19.20,59.30.
Dunkel. 19.20.58.0
Edenbrugh the chiefe cittie in Scotlande. 17. 15. 59. 20.
S. Johns. 15.40.59.15.
The middes of the 30. Ilands adiacent to Scotland.
Dzchney Longitude 30. 0. Latitude 61. 40.
Of the Iland called of Ptolemie, Thyle.
The mids of this Ilande. 70. 0. Latitude. 65. 30.
Yarſol a cittie. 7,40.60.42
Thirtes a citie 5.50.64.44
Nadir a cittie. 6.40.57.20.

Of Corsica.

Corsica an Ilande, whoſe chiefe places are.

Iſſria 30.30.40.15.
Mariana 30,10,40,20,
Nebia 31,0,40,40,
Aleria 31.25.40.20

Cicilia an Ilande.

Palerna. 35.30.36.10
Marſara 25.20.35.30
Gergentum 26.20,35,10,
Termine 35,55,36,5,
Pula 36,0,35.30,
Siracuſe 37,20,35.30
Catua. 37.40.36.0
Meſſina. 30.0.36.40.
Aetna the burning hill. 37.10.35.20.

Of the chiefe Citties and Townes in the Ilande of Sardina.

Sardos 30.20.38.58.
Galea 29.40.37.50
Argetara 29.30,36.30
Areſtana 29,45,36,50
Aquilaſtrum 31,20.37.30.
Cambonara 31.30.36.30,
Stira 30.30.36.40.

Of the Ilandes called Maior & Minorica.

Maiorica containeth in

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Longitude and Latitude.
17.40.38.30

Minorica. 20.0.39.0.

These bee adiacent to Spayne.

The next Cadira an Ilande.

Cadira, which is also called the Gades, in the west Ocean, vnder 5, degrees, 30. 34. 0.

Euboea an Iland.

Euboea, now called Nigropont: is an Ilande to Achaia ioyning. 54.0.38.0

Creta an Ilande.

Creta now called Candie, an Iland famous. Longitude is, 55.0.35.20.

Cyclades.

Cyclades are Ilandes about Delus. 56. 10. 37.20.

Sporades Ilandes.

These Ilands are also ioyning to Delus, their Longitudes and Latitudes.

56.10.37.20.

Thus endeth the particuler discription of the chiefe Ilandes in Europe.

Of Spayne I wil particularlie touch the chiefe Cities and Townes, beginning with Castilla, whose principall Cities & Townes are, Tolet, where the famous King Alfonsus made his Astronomicall Tables, containing the mouing of the heauenly bodies, whose Longitude and Latitude. 10,49.37.0

Salamanca. 7,20.38,20,

Valeria now called Concha. 11. 34.43. 5.

Alcala de Enares 10.20 41, 40.

Logronyo. 12.10,44.0

Vattadolit. 10,10,42,0

Gallicia.

Compostella, where Sa. Iames was, 7.0.42.15.

Lands ende. 4,23.44,2.

Almoisa. 4.40.44.45

Bilbao. 11.45,45.25.

Fontarrabie. 13.13, 44. 15.

Saint Sebastianus. 15. 30.45.5.

Nauarre

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Nauarre.

Pompelon.	13.15,42.0
Waganna	12.15.43.0

Cathalonia.

New Carthage.	15, 57 38, 0.
Tarragone	16.12.41.0,
Gerona	17,42.42.12
Barsalona	17,0.41.35
Valentia	14.38.36,10

Arragonie.

Sarragossa	13.45.41.45,
Burges.	10.33.42,48.

Portugale.

Lysbona.	5.0.36.40
Portugallo	4.56.41.35
Arcobriga	5,40.36.35.
Badaior	5,20.39.0,
Cabo of S. Vincention.	2. 32,38,15.
Braga	6,0.43.40
S. Maria Gadalupe.	8, 30,39.30.

Granate.

Granate	8.34.34.20
Hispalis	5.42.37.0
Cordoba	7,4,37.50

Calpe, both one, ỳ pyllers of Hercules, and also a Mountaine called at thys daie Gilbaltar, where the streite is named Zibalter 7,30.36,15

Wama	6,15.38,25
Wagala	8.50.37,30

Of Fraunce.

Fraunce containeth many Dukedomes, it is repleni- shed with pleasant Citties and Townes, of which I will set out the principall, beginning with the West part first.

Narbona hath

Vienna	26,0,45.0
Ebredunum	28.8,43.30
Brianconum.	28.30.45.0

Gratianopolis Granoble. 27. 0, 45.30.

Tarantasia.	29.0.45.0
Gebene.	28,0.45.45

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude with his minutes.

Mauriana 28.30.44.30
Vapincum. 27.15.43.30.
Dinia 27.35.43.5.
Valentia 26.0.44.10
Komonum 26.0.44.30
Sistarica. 26.45.43.20
Viuarium 25.45.43.45.
Auraſicum 26.30.43.30
Auinio 25.45.43.15
Carpentorate. 26.5.43.15.
Tritaſtra 15.45.43.0
Arelatũ. Arles. 25.50.42.45
Maſſilia 26.30.42.5
Tollona. 27.30.42.0
Barcellona 28.30.43.15
Agata 24.0.42.10
Virapiſce. 22.45.42.15
Lodeua. 23.45.42.50
Beſerium. 23 30.42.20.
Mons peſſulanus, Monpelier. 24.30.42.50.
Aſtrericum. 23.0.43.0.
Vabra 23.15.42.45
Varinum. 22.15.43.15
Albia 23.30.43.40
Montalbanũ. 21.30.43.30
Cadurcum 22.0.44.0
Rhodium 23.15.43.30
S. Florus 23.30.44.0
Aniciũ Lepny. 24.30.44.15

Aquitania.

Burdigala 18.0.44.30
Baiona. 17.30. 44.30.
Vaſaticum 18.15.44.0
Tarba 19.15.42.15
Lorona 18.10.42.0
Lebretum 18.30.43.10,
Auſcus 20.15. 43.0
Lombarium. 21.20.42.40
Toloſſa 22.10.42.50
Rinum 21.45.42.15
Conſerana 22.15.41.50
S. Pontius 23.0.42.15
Narbona. 23.30.42.0

Celtica Gallia.

Lugdunum. Lyons. 26, 0. 45. 15.
Niuernium 24.0.46.44
Lamouica 21.30,45.45
Petragoricũ. 21.15.44.40
Engoliſma 20.30.44.50.
Xantona 19.0,45,0
Luriona 18.30.46.30
Nauetum 18.15.47.15
Rhedona 17.30.48.10
Turonia Tours. 20.15. 47.30.
Aurelia Orleans. 20.0

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

47.30.

Constantia. 18.40.49.35
Paris the heade Cittie of Fraunce 23.30.48.40.
Seno. 24.0.47.45,
Cathalanum 25,30,48.30
Lingo 26.30,47.30

Gallia Belgica.

Rothomagus Roan, Longitude,21.30 Latt.49.30,
Catalaunum Chaalon,21. 30. 48. 30
Rettena. Rethe. 22. 26. 49. 0.

Germanie. The chiefe Cities & Townes.

Zeland an Iland, the furdest confines of Germanie the middes of it, in Longitude & Latitud. 25.0.52.0.
Middleburgh.25.26.51.48

Hollande.

Traiectum. Utrick. 27 15.52,20.

Antwerpia.

Antwerpe, sometime the noblest Towne in all Europe. 26,36.51.28.
Louaine, a Universitie. Longitude and Latitude. 20. 36. 50. 59.
Bruxella Brussell. 20. 20. 51. 15
Mechlinia Machelen. 20. 20,51,15.
Lira. Liere. 20.24.51.21

Flanders.

Candauum Ghent. 25. 30. 51. 15.
Bruge Brug 24.30.51.20.
Tornacum. Tornay. 25. 15. 50. 10.

Picardie.

Ambianum. Amiens, 16, 40.49.49.
S. Iodocus. 16.52.52.0
Samarobriga 22,20.52,10

Lucenburge.

Lucenburgum. 25.30.50.0

The Trauailers ioy

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Creutzuacum. Creutz. 24. 34.50.2.
Harbzuccum. Harbzuck. 23,47,49,16
Keyserluterna. 24.44. 49,22.

Gulich.

Bonna, Bonne 23.23 50. 47.
Juliacum Gulich. 22.44. 51. 8.
Leodium Ludich. 21. 48 50. 51.
Aquisgranum, Achen, 28,45.50.55.

Geldria.

Geldzia, Gheldere. 23,48, 51, 42

Cleuia.

Cleuis Cleff. 22.6,52.0

Heluetia.

S. Gllus. 27.6,47.8.
Constantia. 26.43,47,30
Tigurum Zurch. 26.36

46. 48.
Badena Badē. 25.16.48.44
Lucerna. 26,0.46.34.
Friburgum. 37.30.51.50.
Berna. 24,18.46.25

Alsatia.

Colmaria 24,3,48,12.
Selestadium Schlestad. 24.6.48. 22.
Cesarmontanum, Keyserspers. 23. 48. 48. 14
Hagenoia, Hagenau. 24. 36, 49, 7.

Cities of basse Germany.

Colonia Agrip. 29.45.5.0.
Campena, Kampen. 23. 30. 52. 50.
Constuence, commonlye called Coblentz, where two fayre Riuers, the Rheine and Mosel, meete. 30,15,50. 20.
Andernachum, Andernack 30. 0. 50. 25.
Cities and Townes of high Germany.

Maguntia,

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

Maguntia, Mentz, ỷ Arte of prynting first founde (by Iohn Faustus,) in the yéere of Chryst our Sauioure. 1453. The Longitude and Latitude. 31.15.50.0.

Wormatia Wormes. 31.30 49. 40.

Spira Spier. 31.30.49.15

Argẽtina, Strausborough a notable Cittie. The Longitude and Latitude is. 30.15.48.45.

Basilia Basile. 29.45.47.45

Schathusa. 28.0.47.28

Curia, Chur. 32.0.47.30

Uelalia, 26.20.51.30,

Francofordia. 31.40.50.10

Curia. 32,0.47.30

Warburgum. 32.10.51.0

Bremen. 32.10.53.40

Hidelbergum,

called Hidelberge.

Lon, & Lati. 32,0,49,30

Ulmes. 33.0.48.30

Herbipolis wirtzpurgk, 33.33.50,0.

Amberga. 34.0.47.15

Augusta. 34.0.48.15

Brunsuiga. 34.40.52.40

Ingolstadiũ. 34.45.48.30

Hamburgũ. 34.0.54.30

Limeburgum. 34.45.5.45

Ratisbona. 35.40.49.0

Erdfordia. 35.0.51.10

Lubecum, 35.20.54.50

Liptzigum. 36,30.31.30

Magdaburge. 36.10,54 50

Salisburgum. 36,30.47.30

Brandenburgum. 37.20,52.40.

Rostochium. 37.10.54.36

Misna. 37.20,51,50

Peurbachiũ. 37,35,48.15

Berlinum. 38.30,52.50

Praga. 38.20,50.6

Cripsualdia. 38.5.54.20

Uratislauia 41.20.51.5

Gran 42,50.47.15

Posna 42.0.52.45

Buda. 43.0.46.50

Lonteth 43.20.52,30

Thorn 43.30.53.30

Traconia 44.30.50.15

Mons Regius. 49.0.45.0

Dantiscum 46.0.54.55

Carolastadiũ. 33.25.50.0

Noribergum 34.40.49.30

Munster 32.0.52.5

Witenberga. 32.10.55.40

Moscouia.

Moscouia is a long and ample Region, the chiefe

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Cittie of their Emperor is also called Moscaua. Longitude and Latitude. 69. 0. 57. 0.

Salenum 37.20.39.30
Naplis 38.50.39.55.
Capua 36.40.40.5
Aquilea. 36.40.41.10.

Illeria and Dalmatia.

Illiria which is called Lyburnia, hath on the North partes Pannonia, on the West Istria, on the South Uenice, and on the East Dalmatia. The chiefe Citties and Townes are,

Sara 40.5. 44.9.
Stridona the Countrey of S. Jerome. 42,20.43.20
Flauona 77.0,44.45

Dalmatia.

Ragusia 45.0.42.20
Sibinicum. 43.0.43.20
Scutara 45.30.41.30
Saloniana 45.0.43.20
Durazo 45.55.40.55

Italie and Lumbardie.

Brundusium. 41.0.39.30
Tarentum 40.30.39.15

Roma.

Rome a Cittie. Longi. and Lati. 36.40.42,0,
Siena 34.10.42.0
Florence. 34.15.42,45.
Viterbia 35.0.41.15
Pisa. 33.0.42.15
Luca 33.30.42.45,
Ancone 36.40.42.30
Bononia 33.30.43.40,
Rhauenne 35.0.43.15
Farraria 34.10.43.50
Parma 32.30.43.50
Uerona 34.0.44.25.
Uenice 35.30.44.45
Padua 35,0.44.45
Mantua 33.10.44.10
Vincentia. 34.39.44,20
Cremona 32.45.44.20
Placentia, 32.30.44.20
Mylan 31,45,44,15
Tortona 31.30,44,0
Genua. 31,30,43,15
Taurium. 30.40.43.45
Pisa 29.30.42.40

Secusa.

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Secusa 29.45,44.0
Grassa 29.50,42.55
Albinga 30,40.42.55
Mercelle 30.30.44.30
Nouaria 30,15.45.0,

A perticuler description of Greece. And first of Macedonia.

Macedonia hath on the North part Thracia, and the higher Mistua: on the West, the Venetian seas, on the South partes Epirus and Achaia: on the East, the Seas called Egeum Pelagus. The principall Citties & Townes of it, are Thessalonica, now Salonica the seate of the chiefe Bishoppe of the Philippians, vnto whome S. Paule wrote two Epistles, the first from Athens the second from Laodicia. The chiefe Bishoppicke of Phrygia, where also S. Paule preached the Gospell. 49. 50. 41.0
Apollonia. 15,6,40,10.
Aulon 44.50.39.56
Bullis 45.0.39,45
Arethusa 50.10.41.0
Panormus 54.40.41.0
Hadrianapolis. 50,55, 44. 45.
Ampelus. 51.15.40.43.
Ioleos 51.3.39,15
Demetrias. 50.30.38.56
Larissa 51.20.38.50
Thebe. Thebs. 51. 10 38. 30.
Armissa. 45.20.40.40
Elima 45.40.39.40
Amantia 46.0.39.40
Albenopolis. 46.0.41.0
Europus 46.30.41.20.
Apsalus 46.20.41.5
Parecoplis. 48.40.41,40
Amphipolis. 50,0,41,30.

Philippis a Cittie where the great Alexander was borne, and from this Citty S. Paule sent his seconde Epistle to the Galathians. Longitude and Latitude. 50. 45, 41. 45
Heraclia. 47.40.41,30

¶ Epirus, whose chiefe places are

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

Nicoplis. 47.30.38,30
Cassiopa 47.0.38.45
Ambracia.iarta 48.8.38.20
Achenæ, sometime the Fountaine & Wel-spring of all good Letters, hære didde Plato and Aristotle teach, it is now destroyed. 52 45.37.15.
Megaris, 52.19.77.30
Peloponesus Morea. 51. 10.37.30.
Dodonam 48.30.26.0
Parnassus, a mount. 50 20.38.0.
Helicon the holye Hyll of the Muses, at ỳ foote wher of is a Fountaine. Longitude and Latitude. 51.0. 37.47.
Pythia, the place where Apollo gaue Oracles. 50, 30,37.45,
Constantinople, sometime a Cittie vnder the Christi an Empire. 56.0,43,5
Corinth, the Bishops seate in Achaia: hether S. Paule wrote two Epistles, the first from Philippis, a cittie in Macedonie, by Stephen Fortunatus, and Achaicus. The seconde Epistle by Titus and Luke. 51.15.36.55.
Stymphalus. 50.20.6.20.

Thus endeth the perticuler description of Europe.

A PARTICVLER DES-cription of *Affrica*.

AFrica, beginneth at Gaditanum Fretū, (a narrowe straight comming out of the Ocean into the middle earth Seas, and haue Spaine on the North shore, and the Mores on the South.) And it doth ende at the Egiptian Seas, On the North it haue the middle earth Seas, on the South shore the great Ocean, on the East ẏ Sea, which stretcheth almost to the middle earth Seas. Affrick is deuide in two partes by the Hill Atlas, which the lesser extendeth to the middle Earth Seas: the greater part goeth beyond this Hill vnto the South Ocean. The greater part of it is not inhabited for two causes: one is for the extreame heate, beeing vnder the burning Zone, the Sunne draweth all the moisture of the earth from it, so that for want of water no man can there liue. The second is for the innumerable multitude of venemous Wormes, and wilde Beastes, which are naturally enemies vnto mankinde. As the Lion, the Oliphant, the Tiger, and such like. Also Dragons, Corcodiles, Cocatrice, and sundrie other venemous Wormes, in such sorte, that the inhabitauntes are compelled to put on Bootes, for better auoyding theyr stinge and poyson. The part that is inhabited, is fruitfull enough. The people blacke, Sauage, monsterous, and rude: yet in those Countries, Citties and Townes where the Spaniards, Portugales Italians, and other do frequent, the people are somewhat more ciuill, modest, and reasonable, and if you desire a longer discourse touching Affrick her inhabitantes, and commodities, reade Strabo second or 17.

bookes, and also Plinius his 8. booke, with diuers other writers which at large do hereof intreate, and now I do meane to followe, and set out the notable regions which Ptolomæus numbreth to be 12 . with their chéefe Citties, Townes, Hilles, and Riuers, with in Affrica: and first will beginne with Mauritania, which is deuided into *Mauritania* Tingitana, and Mauritania Cæsariensi.

Of the principall places in Tingitana, or Barbarica, Mauritania.

Fesse. 10.0.30.0
Tinges Cesarica called commonly Tanger. 6,30 35. 40.
Abilis one of Hercules pillers, is a Hill against Calpe, an other Hyll in Spaine. 7,50.35.40
Baba 8.10,34.20
Banasa 6.30.34.20
Septa 7.30.35.55
Sala 6.15.34.0
The Sunnes Mount. 6. 45.31.15
Benta. 9.30.33.40
Dorathe 10.10.31.15
Tamusida 7.15.34.15

Mauritania Cæ-sariesis.

Apollos promontorie. 15. 30.33.40
Julia Cesaria. 17.0.33.20
Tucca 20,0.31.30.
Hippa 20.15.29,50
La Guardia. 12,0,34.20
Cilla Cerlel 18.45.32.10

In Africke the Lesse.

Colops the greater. 27. 40.32.20.
Colops the lesse. 29.20 32. 35.
Hippon. 30.30,32.15,
Utica, where Cato died, now called Benfert. Lat. and Lon. 32.0.32.45
Carthage 34.40,31,50
Clupea. 35.0,33.20.
Sabatra 41.0.31.0.
Masanum 33.15.32.20
Dabia. 33. 0. 29. 40

Numi-

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

Numidia.

Culuca. 28,30.31.0.
Tucca 29,30.31.20.
Bizancina. 37.50.30.40
Capsa 37.30.29.45
Calatha. 31.0.53.40
Sabzata. 41.15.30.15.
Ammon 65.30.28.0
Oasis ỹ great. 59. 20.26.55
Alexandzia. 60.30.31.0
Memphis 62.50.29.50
Cayzum. 62.15.30.0.
Syenne 62.15.23,50.

Libia interior.

Tagaza 7,0.15.40
Tuchozoza 12,30.16.0
Tambutum. 15,30,15.40

Meroe.

Meroe is an Iland of Nilus, sometime called Saba where S. Mathewe did preache the Gospell. From hence came the Quéene of Saba, to heare Salomons wisedome. 61,30.16,25

Quiola.

Quiola, or Cayla, is a Region, in which great plentie of Cinamon growes, the chiefe Citties are.
Hamaharica. 65.0.9.10
Maska. 67.30. South pole. 4.15
Beritis 60.40.21.31
Quiola. 76. 30. South pole. 7.30
Sabath 67.30.12.30
Mombaza 79.0. South pole. 6. 0
Melinda. 82,30,2.0
Cauaquin 80.0,9.50

Babell mendap. There are the straights of ỹ Red Seas. 74.50,11,0

Of Citties of sundrye Regions in the South Æthiopia.

Goia. 60,50. S. pole. 19,50.
Garma. 57.0. S. pole. 24.0
Bali. 70,0.21,40
Meli 33.0.16.30

Of the notable Ilandes about Affrick.

Porto sancto. 0,35,31.30

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Wedera an Iland, first inhabited of the Portugales it aboundeth wyth Suger, Honie, Ware, and sundry Herbes. 358.40.29.50.

The Canarian Ilands being 10. in number. 1.30. 23. 30.

S. Thomas Ilande. 32. 30. 0. 30.

Madagascar, which is also called S. Laurence Iland. There the North Pole is not sene, and the Needle in sayling wil do no seruice, Therefore they are constrained to vse Astrolabs, and other Instruments 85 30. Southpole. 20.0.

Thus endeth the description of Affrick.

Of *ASIA*, THE THIRD part of the Earth.

ASia is as much as Europe and Affrick, and containeth (after Ptolemies account) 48. Prouinces. It is parted into Asia the greater, and Asia the lesser, Notwithstanding, diuers wryters vse this word Asia the lesser, more largely then Geographers doo. For they call all that portion which is within the South shoare of the Pontick seas, and

and the East Seas Pelagus Ægeum, and the Northe part of our Ocean, and the West parte of the Ryuer Euphrates, to be Asia the lesser. Asia containeth in, Bythinia, Pontus, the lesser Asia, Lycia, Galatia, Paphlagonia, Pamphilia, Capadocia, the lesser, Armenia, & Cilicia. Asia doth farre excel both Europe and Affrick, for it is fruitfull, and hath so pleasant fieldes, such plentie of foder and pasture, the heauens gyuing moysture to the earth in due season. It hath aboundaunce of gold mines. It bringeth forth plentie of Cynamon, Gynger, Aloes, and diuers Aromaticall spyces, & Gummes. There are diuers straunge Beastes bredde in Asia, as, Unicornes, Cammelles, Liberdes, Mermosites, Mercats, Cryppes. Yet one thing is to them infortunate, that there are terrible and many Earthquakes, in so much that there hath bene tenne, and 12. Citties at one time subuerted and ouerthrowne. The Inhabitants are sundry, and diuers: for some are Anthropophagi, which eate flesh of menne, and drinke theyr blood. There are also Pygmeans, (men but a Cubite in height) which ryding on Goates and Rammes, do kéepe warre with Cranes. There are diuers other formes of Inhabitaunts reSited of Plinie, which at this present I wyllingly ouer passe. The spirites in this Countrie, by many illusions, séeke to bring Trauyalers into daungers, sometime by calling them by their names, other times by Musicall noyse, as it were alluring them by sweetenes of the sounde, vntill they bee brought into daunger through wylde beastes. But now (these thinges omitted) I wyll briefely sette downe the principal places of Asia, beginning with Pontus & Bythinia.

M.i. Pontus

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Pontus and Bythinia.

Chalcedon 56.20.43.5.
Olbia 57.0.42,40
Nicodemia 56,0.42.40
Claudioplis, where Saint Luke did wryte his Gospell and the Acts of the Apostles 59.30.42.45
Nicæa, where the Nicene counsell was, 58.0.42.15
Cæsaria, Smirdiana. 56, 40.41.40.
Olimpus, an Hil of which I spake in the first Booke. 57.0.41,40.

Asia.

These following are properly called Citties of Asia.

Lampsacus. 55.20,41.25
Illium, sometime called Troy, now ruinous. 55, 50. 41. 0.
Dardanum, Dardanellum 55,25,40.5
Alexandria 55.25.40.40
Autandrus 56.30,40.20
Smyrna, ỳ Country wher Homer was borne. 58. 25. 38. 25.
Assum. 56.30,40.15
Ephesus, the chiefe Citie in Ionia, in which S. Iohn wrote his Gospell. 57. 40.37.40.

Citties of Caria.

Heraclea 58.50.43.30
Miletus 58,0,37.0
Mysa 59,0,38,15,
Antiochia 59,30,38,20
Neapolis. 59,25,38,35
Trallis, which is also called Emanthia, at which place certaine suppose Pigmians inhabit. 58.40.38.5

Of bothe Lidias.

Philadelphia. 59,0,38,50
Sardis 58,20.28.15
Sala 60.15.38.20
Sanis 60.0.38.20
Hierapolis 55.20.38.15
Apamia 55.30.42.0

Citties of Lycaonia, or Licia.

Carya 59.50.35.55
Patara.

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Patara 60.30.36.0
Olimpus a Cittie. 61. 30.36.10,
Xanthus, patara. 60.30 36, 40.
Pigra 61.0.36.45

Citties of Galatia.

Sinopastala. 63.30.43.0
Pompeiopolis, so called because Pompey builded it. 62.0.42.0
Claudiapolis, 63,15,42,20.
Ancyra 62,40,42.0
Leodicia 60.15,38.40

¶ Of Pamphilia.

Olibia 62,0,36.55
Magydis 62.40.36.55
Seleusia 62.0.38.30
Antiochia 62.30.39.0

Citties of Doris.

Alicarnassus. 57.50.36.10,
Cadmos a hil. 59.40.37.40
Phenix an hil. 58,0.36.30,
Apollonia. 57.0.39.45,
Pargamus, here was the noble Philitian Galenus borne, which made philick perfect, & erpoundes Hipocrates. 57.35.39.45

Capadocia.

Trapezus Genech.
Sebastopolis. S. Greg. 66.0.41.20.
Archelais 64.45.39.40
Zama 65.0.40.45
Coesaria Maza, here was Basilius Magnus Bysshoppe. 66.30,39.30

Of Armenia the lesser.

Satala. 96.50.42.10
Nicoplis 69.20.41.40
Ispa 70.30.40.20,
Camana 68,0.38.0.
Claudia 71.0.38 45,

Cilicia.

Antiochia. 64.40,36.50
Agææ 69.0.36.30
Seleucia. 66,10.36,45
Tarsos. S. Paules Countrey. 67.40.36.50
Epiphania. 69.30.36.0,

Of Colchis.

Neapolis. Negapotimo, 71.30.45.40.
Capolis. 72,0.45.30

The two first numbers shew the Longitude with his minutes. The two second shew the Latitude with his minutes.

Phasis 72.30.45.0
Pavia 74.15.46.15

Of Iberia,

Sura 75.0.45.20,
Zalissa 76.0.44.40
Varica. 75.20.46.0.

Albania part.

Gelda 83.0.46.30
Albana 81.40.45.50
Barchia 77.0.44.40
Baruca 79.20,44.40

Armenia the greater.

Lala 76.10.44.0.
Bizaca 74.50.45.30
Babila 73.15.40.45
Anarium 76.50.41.30
Belcania 73.50.39.40.

Of Syria, the Cities.

Alexandria 69.30.36.10
Selutia 67.30.32.50
Laodicia Ramatha. 88. 30.35.3.
Posidium 88.30.35.15
Byziandrus Alapso 69. 30.35.50.

Phænicia.

Tripolis 67.30.34.20
Biblus 67.40.33.55
Sidon 67.30.33.30
Tyrus 67.5.33.18
Sor, commonlie called Sur, a Citie after the ruine of Alexander Christened: now destroied of the Turke, of the two Cities Sidon and Tyrus, Christ our Sauiour in his Gospell speaketh.
Ptholomais, Acon. 66.50 33.0.
Berytus, but of our trauellers now called Barut, it is the Port of Damascus. 67.0.33.20
Botrys, Botrus. 67.50. 34.5.
Dora 66.30.32.40
Antiochianie the mount Taurus of the countrie of S. Luke Euangelist 69. 0.35.30.
Leonia 70.30.36.20

Of

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

Of Curua, the Cities.

Abila Lysanium 68.45. 33. 20.
Damascus, héer did Caine slaie his brother Abell. 69. 0.33.0.
Adra 68. 40.32.10
Hippus Sephet 68. 0. 32. 30.
Capitolia Suueta 69. 45 32.30.
Philadelphia 68.0.31.20

Laodicina.

Paradissus 69.45.33.35.

Iudea or Palestina.

Joppa, Joppen, or Jaffa, a Port which was builded before the Diluge, 65. 45.31.55.
Ascalon Hibelis, commonlie called Escolona. 65.0. 31. 40.
The dead seas or Lake of Sodome. 66.50.31.10

Of Galilæa.

Julias, or Bethsaida, the countrie of Peter and S. Andrew. 67.5.31.15.

Of Samaria.

Neapolis Sichen, héere did Christ convert the Samaritane. 66,50,31,50

Iuda.

Gaza 65.25.13.15
Sebasta Samaria 65. 40.31.30.
Lydda Rama 66.0.32.0
Ericus Jerico 66.15.31.25
Nicopolis sometime called Emaus, héere was Christ knowne by breaking of bread. 65,45.31.50
Jerusalem which is now called Capitoia, and haue diuerse other names: héere was our Sauiour Christ crucified, and paid the ransome for our sinnes in the beginning of the foure and thirtith yeare of his bodilie age. 65.45.31.22.

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Idumæa.

Berzimma 64.50.31.15
Waps Massa. 65.40.30.50

Mesopotamia.

Porsica 72.0.37.30
Soleucia Mosell. 79.0. 35.40.
Edesse Rase 72.30.37.30
Zama 75.20.36.30
Carre, Charan, héere did the holie Patriarch Abraham dwell. 73 45.36.10
Babilon Baldache, the chéef bishops sea in Chadea héere (Builoing the Tower Babell) sprang the confusion of tongs. 79.0. 35.0.
Bilba 79.0.35.0
Cesa 76.40.32.50
Thelma 77.40.32.0
Dycho 78.30.32.40

Arabia, which is parted in three parts, *Arabia deserta, Petrea,* and *Felix.*

Erupa. 72.30.30.15
Soza. 75.0.30.20
Thora 72.3.32.40
Salma 78.20.29.20
Lysa 65.50.30.15
Petra 66.45.30.20
Lydia 69.0.30.40
The Red Seas through which Moyses and the Israelits went. 63.30.29.50
Mount Sinaye, which is also called the mount Oreb, or Thoreb. Héere receiued Moises the ten commandements. 64.0.30.0
Thebe 69.40.21.0
Muza 74.30.14.0
Sanina 75.30.11.30
Arabia Aden 80.0.11.30
Moscha 88.30.14.0
Cabana 85.0.23.0
Istriona 80.25.[illegible].40
Badea Cydea 70.0.20.15
Mecha, héere is the Sepulcher of Mahomet, which the Turkes goe to visit with great deuotion, and yet strangers comming thether sée no other thing then a golden shoe hanging in the rooffe of the Temple. 72.15.23.0
Saba, the seate of Gaspar the King, which brought Golde of Arabia to offer vnto

The two first numbers shew the Longitude with his minuts. The two second shew the Latitude and his minutes.

vnto Jesus being a childe. 76,0.13.0.

Asiria.

Ninus, Niniuie, a great citie, but now desolate, vnto which Jonas the prophet was sent. 78.0 36. 0.

Ctesiphon. 80.0.35.0
Arbila. 80.0.37.15

Media.

Zalaca 86.15.41.0
Mandagara 87.45 39.30
Echatana 88.0.37.45
Veneca 93.20.38.15
Gariauna 51.0.37.20
Trauara 92.0.37.40
Agra 80.30.33.45

Susana.

Asa a Cittie. 80.10.31.40
Susa Sambyagata. 84. 0.34.15.
Tariana 84.0.32.30
Agra 80.30.33.45

Persia.

Arima 87.45.33.50
Persipolis 90.0.33.10
Diodorus 91.0.33.20
Miserga 90.15.34.0
Tragonica 87.40.32.40
Vassara 81.20.29.50

Carmania.

Agris 96,30.23.0
Germaria 100.0.29.0
Thaspis 98.0.27.40
Armusa 94.30.23.30

Parthia.

Hecatompylon, a Cittie which hath an hundred gates. 96.20.37.50
Rhoara 98.30.38.20
Amborodar 94 30.38.20
Kagea 98.20.34.20
Appha 98.0.35.20

Hircania.

Hercana 98.30.40.0
Adrapsa

The two first numbers shew the Longitudes with his minuts. The two second shew the Latitude and his minutes.

Adrapsa 98.30.41.40
Saca 94.15.39.30

Margiana.

Sena. 102.30.42.20
Ialonium. 103.30.41.30
Antiochia Margiana. 106. 0.41.40.
Nigea. 105.0.41.10

Bactriana.

Thomara 106.30.24.40
Menapia 113.0.41.20
Bactra 116.0.41.0

Sogdiana.

Prepsa 130.0.45.0
Alexandria Oriana 113.0 44.40.
Scythia within the mount Emaus.
The kingdome of Chatay is vnder the great Cham, King of the Tartarians, the chéefe Cities are Illedon Scithica. 150.0. 48.30.
Soeta. 145.0.35.20

Serica.

Illedon Serica. 162. 0.48.30.
Sera. 177.15.38.35
Dama 156.0.51.40
In this countrie breed the wormes which make silke, we call them in English Silke wormes, of which at this daye the Spaniards haue great plentie.

Aria and Ariana.

The middest of it. 106. 0.35.30.
Namaris. 105.40.36.10
Articaudua. 106.20.36.0
Alexandria. 110.0.36.0

Drangiana.

Asta 107.30.36.0
Bigis 111.0.29.20
Agriapsa 108.0.34.0

Gegrosia.

Guni 110.0.23.50.

Parsis

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

Parsis. 106.30.23.30
Arbis 105.20.20.30.

India within the Riuer Ganges.

Bardarima. 213.40.20.40
Monoglossum. 114.10.18.20
Mandagara. 115.10.14,20
Colchi now called Crichina, vnto which the Lucitanians are very frendlie. 123.0.15.0
Salur 125.0,15.0
Bizantium. 113,40.14.40.
Tyndis. 138,30.16.10
Caticutium. Calecht. The moste famous Cittie of Merchandise in all India, they haue a proper King of their owne: but the Crowne comes not by succession vnto their Childrē, for this cause, for they haue this vse, that when any man marieth, he must committe his wife to the Priest to be deflowred. Vnto this Citty, is brought from all India, all kinde of spice, Cloues, Nutmegs, Ginger, Cinamon, Rubarbe, Muske, Saunders, Aloes, Cassia, Also precious stones of diuers kinds and all manner of Silkes. There are diuers sortes of inhabitants in this Cittie: Christians, Turkes, Mahomets, Caffranans, Idolaters. And this last kinde do often (as it were in token of frendshippe) lende their Wiues one to an other. 112.0.5.0
Similla. 110.0.14.45
Hippocura. 120.30.4.0
Caticardama. Coziman-del. 136.20.12.40
Sambolaca. 132.15.31.50

Prasia.

Palibotra. 143.0.27.0
Tamalitis. 144.30.16.30
Sambalaca. 141.0.29 30

Countries & Citties without Ganges in India.

Pantaplis 150.0,18.0
Baracura Bangella. 152 30.16.0.

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Sabara 159.0.8.30
Begynga. 162.20.8.26
Tacola 150.30.40.15
Sabana 160.0.3.0
Coliplis 164.20.0.0
Balonga 167.30.7.0
Synda 167.15.30 40
Tagoza 168.0.6.0
Eldana, bether came saint Thomas to preache the Gospell. 152.0.13.0
Trygliphon 154.0.17.0
Gozgatha 167.0.12.30

Chatay, a region.

Chataio 222,0.43.50
West Ciamfu 222.0.37
Quinsay, the greatest citie in all the earth, and is as much to say with vs, as the heauenlie citie, in the middest of it is a Lake, which in the circuite haue 1200 bridges. 226.0.37.40
Geiten 259.0.25.15
East Ciamfu 231.0.32.5.17
Focho 240.55.7.0
Tingrei. 236.0.35.0

Mangi, this conteineth in it nine kingdomes.

Taygin 224.15.31.0
Sygni 232.0.29.20
Thebet, a prouince in which the great Cham, Lord of the East and south Indians hath his seat, and all the kings of Indians haue his seat, and all the kings of India are vnder him. 204.10.3.20

Cyamba.

Cyamba. 208.10.25.30
These vse Corall in the stéed of money, they haue great plentie of Nutmegs, Aloes & all kind of spices.

South India.

The inhabitants are all Idolaters, and haue these kingdoms following.

Lamia 202.10.11.40
Worfuli 285.0.13.0
Thine. 180.0. Southpole 3.10.

Moabar.

Mar, the inhabitants do worship Oxen. 276.0.
Southpole. 20.10
Malaqua, héere was saint Thomas slaine. 260.6
Southpole. 15.30

The kingdome of Lac.

Lac, a Cittie, the inhabitants

The two first numbers shew the Longitude with his minuts. The two second, shew the Latitude and his minutes.

tants worship Oxen, and are great Idolaters, yet iust in their affaires, and haters of lies and liers, 166.30.21.40.

Of the Ilands a-

diacent to Asia and India, and new regions of this third part latelie found out.

Cyprus.

It is an Iland in the middle earth Seas, in which Japhat, one of Noe his sonnes first inhabited, 65. 30.35.10.

Scotora in Arabia the happie, now it is called Scoyra. 86.20.12.0

Ormusa is an Iland in the narrow Persick seas, 96.20.19.0.

Tabrobana.

It is also named Samotra it is a great Iland, 151.15. It is without Latitude, because it is vnder the equinoctiall.

Coo.

Coo an Iland, in which the prince of Physitians Hippocrat. was borne. 57.0. 36.25.

The Greater Iana.

Iana. 179. 0. The Southpole. 7.30.

Borno.

Borno an Iland. 1780.0
the South Pole. 2.30

The lesser Iana

Iana. 188.9. vnder the equinoctiall.

Ambicon.

Ambicon, 166. 0, The South. Pole. 7.0

Gelilo.

Gelilo, also Solor, one of the greatest Ilandes of Moluck. 204. The South Pole. 1. 0.

Ilands of Moluck.

The other Ilands are vnder, 193. 0. 9. 0. degrees.

The two first numbers shewe the Longitude with his minuts. The two second shew the Latitude and his minutes.

Iucatan.		of Cancer.	
Iucatan.	257.30 19.0	Iamaica.	
Cuba.		Iamaica.	270.0 19.30
Cuba	269.30.23.30	Vasandrea.	
It is vnder the Tropicke		Vasandrea.	331.3.40.0

Thus endeth the perticuler description of Asia.

A PARTICVLER

description of some parte of *America*, as by trauaile is found out.

AMerica which is named the fourth part of the earth, and was to Ptolomeus, and the auncient Geographers vnknowen: as also at this present, great parte of it is not yet found out, it taketh the name of America of Americus Vesputius, who by the commaundement of Ferdinando King of Castell, found it out, in the yere of Christ our Sautour, 1497. about the ende of June, as doth appeare by his owne testimonie. The people both men, and women are naked, neither suffer they any haire to growe on they^r bodies, no not on they^r browes, the head except, they are excellent in swimming, both men and women, so that they without wearines can swimme two Leagues. Their weapons are bowes and arrowes, which they prepare, and heade with stones, and the teeth of Fishe, for that they wante Iron, and all mettaile (Gold except.) They haue warre with the inhabitauntes of the Countrey next them, which haue an other language. But it is not for riches, for inlarging they^r signorie, or election of a King: but for to reuenge the deathes of their predecessors. There is no lawe or order obserued of wedlocke,

for

for it is lawefull to haue so many women as they affect, and to put them away without any daunger. They be filthy at meate, and in all secrete actes of nature, comparable to brute beastes. Their bread is rootes, and their meate mans flesh, for all they? enemies, which they ouercome, they with great banqueting deuour. Their houses are builded like the shape of Belles, and couered with Leaues and Palmes of trées, they vse no kinde of Marchandise, and as for Golde, Pearle, Stone and that we haue in great prise, they haue in no estimation. For they? ritches is in feathers of diuers colours and stones, which they hange on they? eares and lippes for an ornature. They do honour the Sunne, Moone and Starres, thereis also in the West part of America, a region called Peru, most ritch of all other that hetherto haue béene found, bothe of mettailes and precious Drugges. Their chéepe be of such fertilitie, that they twise yérelie haue Lambe. The inhabitantes are ciuil, wise, prudent, skilfull of Marchandise. But yet they know not Christ, the middes of America is in degrées, 330.0. The pole Antartick, 10.0. The breadth of it is, 2100, English miles, the length 3000, miles. There are diuers and sundrye Ilandes about America, in our dayes founde out of which hereafter shall followe the principall.

¶ Peru with the shoare towarde Spaine.

Peru. 290. 5. 0. South pole

Caput de Stado. 317. 0
2. 30.

Archay Chersonesus. 303
0. 5. 0.

Sinus aquæ dulcis, héere are seauen Ilandes found, in which are great plentie of pearles and precious stones 322. 0. South pole. 4. 30.

Riogrande. 329. 0. South pole. 4. 30.

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S. Rochi. 341. 0. South pole. 8. 15.
Caput S. Crucis, heere Magelanus found a Giant x. foot in length. 345.0.14.0
Rio.s.Jacobi. 356.0.23.30
Rio de s.Lucia. 341.0.27.20

Ilands adioyning to America.

Riqua ỹ lesser. 296.0.10.0
Riqua the greater. 300. 0.9.0
The Ilande of Giants. 308. 7.5.0
The Iland of Brasill. 305,4.6.10.
Laponto. 318.30.4.0.
Spagnallo, heere is founde Guaicum that healeth the Neapolitant sickenes. And the middes of the Ilande containe. 305.0.23.0

Ilands toward Affrica are innumerable. Of which, these are found out.

Todosantos. 332,30.17.0
Defezana. 323.0.18.0
Degadalupo. 331.10.15.30
The greene Iland. 347 0. 14. 0.

A perticuler Table of the Latitudes of the chiefest places in Spaine, and of the Indies.

	Pole. Degrees.		Pole. Degrees.
Alcala d' Henar.	40	Cabo de finis terræ.	43
Alcala la real	37	Caceres	40
Alcantar	39	Cadiz	36
Alicante	38	Calahorra	42
Almeria.	37	Calatraua	39
Alunnecar	37	Camora	41
Astorga	42	Caragoca	42
Auiles	43	Cardono	41
Baco	37	Carmona	37
Barcelona	40	Cartagena	38
Belezmalaga	37	Ciguenca.	41
Bilbao	43	Ciudad real	39
Braganca	42	Ciudad rodrigo	40
Burgos	42	Conubra	40
Cabo de S. Vicente.	37	Cordoua	38

	Pole. Degrees
Cozia	40
Cozunna	43
Cuenca.	40
Denia.	38
Durango	43
Ellerena.	38
Empurias	41
Euoza	39
Ecija	77
Euente rabia	43
Gandia	38
Gibzaltar	36
Girona	41
Granada	37
Guada laiara	41
Guadalupe	39
Guadix,	37
Laredo	43
Leon	42
Lerida	41
Lisbona	39
Logronno	42
Lora	37
Lucena	37
Lugo.	43
Madzid.	40
Malaga	37
Mallorca	39
Marbella.	36
Medina de rio feco	42
Medina del campo	41
Medina celi.	41
Merca	39
Meranda de Ebzo	43
Murcia.	37
Naiara	42
Oporto	41
Orense	42
Orihuela	37
Ouiedo	43
Palencia	42
Pamplona	43
Perpinnan.	42
Plasentia	40
Ponferada	42
Ronda	36
Rosas	41
Salamanca	41
Santiago	43
Sanlucar.	37
Santander	43
Santaren	39
Sanuic dela barq.	43
Segouia	41
Seuilla	37
Simancas	41
Soria	42
Tarifa	36
Tarragona	40
Tauila	37
Toro	41
Toledo	40
Trugillo.	39
Tudela de nauar.	42.
Tui	42
Valencia	39
Valladolid	42
Ubeda	38

	Pole. Degrés.
Vermeo.	43
Villena.	38
Xativa	38
Xerez de la front	37
Xerez de badaioz.	38,
Ilands de Canari.	
Canaria	28
Fuert Ventura	28
Comera	28
Hierro.	28
Lancarote	29
Madera	33
Palma	29
Puerto santo	33
Tenerife	28
Ilands de Barlouento.	
Bahama	27
Cubagua	11
Desseada	15
Guadalupe	15
Hauana	23
Jamaica	18
Margarita	11
Matancas	23
Puerto rico	18
Puerto de plata.	20
Santo Domingo	18
Pueblos de tierra Firme.	
Cabo la Vela	12
Cartagena.	10
Coquibacoa.	12

	Pole. Degrés.
Cabo grans a Dios.	15
Cabo de Hondur	16
Cocumel	19
Maracapna.	9
Nombre de Dios	10
Puert d' cauallos	15
Santa Marta	11
Veragua	10
Vene cuela	8
Pueblos de Nueua Espanua.	
Cacatula.	18
Chiametla	20
Colima	18
Granada,	10
Guatimala.	15
Guaraca.	22
Gua Zaccalco	17
Leon	10
Mexico	20
Mechoacan.	17
Nicaragua.	9
Panuco	23
Realeio	13.
Tecoantepec.	16
Tlascala	20
Veracruz	18
Xalisco	22
pueblos de la mar del Sur y del piria.	
Arequipa.	16
Atuncolla	14

	Pole. Degrées.		Pole. Degrées.
Ayagmire	15	Puertonicio	1
Bogota.	2	Popayan.	3
Charcus, o ciudad.		Potosi	20
De a plata	20	Quito.	0
Chuquiao	17	S. Juan de Aucer. n.	4
Caly	4	Santiag del Stero	28
Chaparra	3	San Juan	4
Cuzco.	14	San Miguel.	5
Chucuito	19	Trugillo	8
Guamamanga	13	Tarira	22
Guamaca	24	Timana	2
Lima.	12	Tumebanba	2
Pasca.	15	Villaviciosa	1
Panama	9	Zaura	12

The names of the thirtie and two poyntes in the Ship Compasse, which be the Wynds names, the Mariners sayle by.

Noꝛth	East, noꝛtheast
South	East and by noꝛth
Easte.	East and by South
west	East southeast
west and by Noꝛth	Southeast and by easte
west Noꝛthwest.	Southeaste
Noꝛthwest and by west	Southeast and by south,
Noꝛthwest	South southeast
Noꝛthwest and by noꝛth	South and by easte
Noꝛth noꝛthwest	South and by west
Noꝛth and by west	South southwest
Noꝛth and by East.	Southwest and by South
Noꝛth noꝛtheast	South weste
Noꝛtheast and by noꝛth	Southweste and by west,
Noꝛtheast	weste, southweste
Noꝛtheast and by easte	weste and by South

NOw you dw vnderstand the thirtie two poyntes in the Ship Compasse: it is also necessarie to knowe and vnderstand, how many minutes a poynte containeth. The poynt containeth foꝛtie fiue minutes, that is thꝛée quarters of howeꝛ an, and thirtie and two times foꝛtie fiue minutes, maketh a thousand fowꝛe hũ-

dzeth and foztie minutes, which being reduſed in two howers, giuing thzéſcoze minutes to an howr, yéldeth 24. howers, the whole circumference of the compaſſe. And to ſhift the Sunne and the Moone by the poyntes of the Compaſſe, it were neceſſarie foz you to deuide the compaſſe into thirtie euen poyntes in this wiſe, deuide the two odde poyntes into thirtie partes giuing to euery poynte thzée minutes of an howr, (foz ſo it falleth out in the diſtribution) foz the two poyntes in the compaſſe yéldeth foureſcoze and tenne minutes, to be deuided in thirtie partes, then doth euery poynte in your compaſſe, containe foztie eight minutes of an howr. Now to wozke by your compaſſe to ſhifte the Sunne and Moone, I will ſet downe vnto younge ſcholers deſireus of ſkill, a verie eaſie & playne way, marke well when the moone changeth, the which is found out by the Epact, and when ſhe is an houre olde, ſhe is two minutes behinde the Sunne, ſo that in 29. houres the moone is 48. minutes of the Sunne, and that is the 30. parte oz poynte of your compaſſe and becauſe that there is 15. dayes from the change to the full, if ye multiply 48. minutes by 15. it yéldeth 720. minutes, which béeing reduſed into houres by 60. minutes it maketh 12. houres and that is the oppoſition oz full of the moone, and thus counte againe from the ful to the change, foz as ſoone as it is an houre after the full, the moone gathereth two minutes neror the Sunne and ſo euery houre increaſing two minutes, till ſhe commeth to the conſunction of the Sunne, and ſo change againe and is called a newe moone.

An other prettie rule or two, to be applyed of the mariner or Saylor worth the noting.

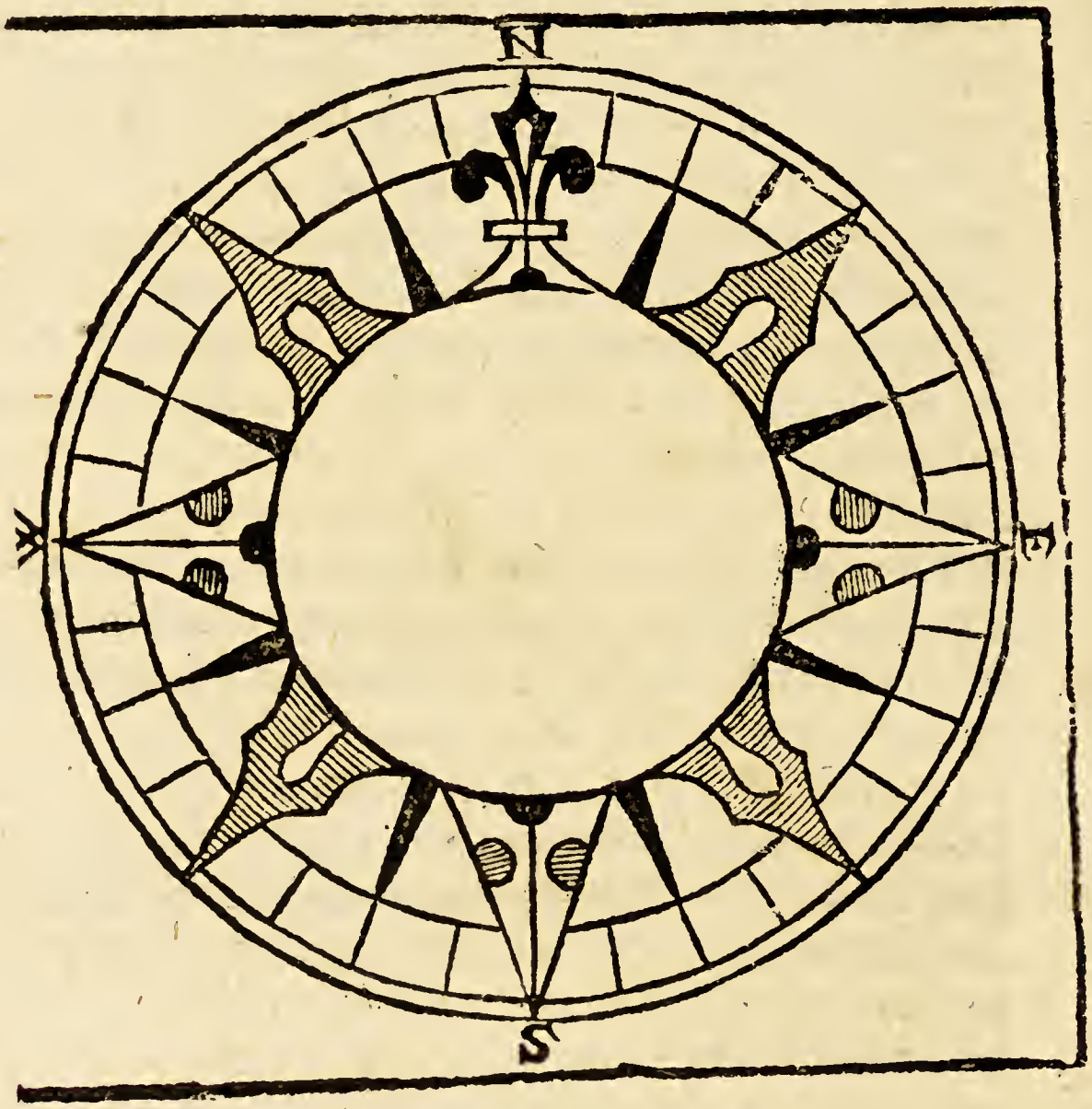
OF the Pzime, the common rule is, that Sunday Pzime is dzie weather, Munday pzime wet, Tueſday Pzime colde & windie, Wedneſday Pzime tempeſtious, Thurſday fayze and cléere, Friday chaungeable, Saterday raine, the thzée dayes from the change, is the Pzime day, &c.

Beda

Beda ſayth if the Sunne be ſpecled, or hid vnder a clonde, betokeneth a ranie day, if he be red and pale, it betokeneth a day of tempeſt, and if he ſæmeth hoariſhe in the middle, ſo that he ſhine in the middle, and ſende out beames towardes the ſouth, betoke-

he is all afore the Sunne, when he goeth firſt forward, the Sunne he ſæmeth with hornes as a bowe, and then alway the hornes be turned Eaſt ward: and when he commeth againe to the coniunction, he receiueth the ſame figure and ſhape, and then the hornes be alway turned Weſt warde, and in that ſide that is turned fromwarde the Sunne, he ſæmeth alway veyd, and the ſide toward the Sunne full of light.

dzeth and foztie minutes, which being reduced in two howers, giuing thzéscoze minutes to an howr, yéldeth 24. howers, the whole circumference of the com-



-led a newe moone.

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OF the Pzime, the common rule is, that Sunday Pzime is dzie weather, Munday pzime wet, Tuesday Pzime colde & windie, Wednesday Pzime tempestious, Thursday fayze and cléere, Friday chaungeable, Saterday raine, the thzée dayes from the change, is the Pzime day, &c.

Bede

Beda sayth if the Sunne be specled, or hid vnder a cloude, betokeneth a ranie day, if he be red and pale, it betokeneth a day of tempest, and if he sæmeth hoarishe in the middle, so that he shine in the middle, and sende out beames towardes the south, betokeneth tempest, moyst and windie: if he be pale, and falleth among black clowdes, betokeneth northerly winde.

An other rule of the Moone.

MArcianus saith the Moone signifieth and betokeneth changing of times, for (as Beda saith) if the Moone be all redde as Golde in the beginning, then she betokeneth windes. And if there be blacke spottes in the ouer corner and wemmes she betokeneth raine in the begining of the monih, if she be red in the middle, it betokeneth fayre weather and cleane in the full mone, and in the night rowing, if the Mones light sparckleth on the oares, then tempest shal come in short time, also the Mone changeth figure and shape: for she sheweth towarde the earth a diuers face of her light: for now she sheweth her selfe shaped bowe wise, now is a circle and round to sight of men. Now Moynoydus, nowe Dictotomos, now Amplutricos, now Pancilenos and he is Moynoydos, when he is new and sæmeth horned: and is Dictotomos, when he is as it were halfe full, and is eight dayes olde, and he is Amphitricos, when it is doubted of his full roundnes, when he is eleuen or twelue dayes olde, and he is Pansilenos when he shineth at full when he is fourteene dayes olde, also the Mone sheweth her selfe in three states: For he is with the Sunne in coniunction, when he is next to the Sun on a side, when he passeth forward the Sunne, or when he is all afore the Sunne, when he goeth first forward, the Sunne he sæmeth with hornes as a bowe, and then alway the hornes be turned East ward: and when he commeth againe to the coniunction, he receiueth the same figure and shape, and then the hornes be alway turned West warde, and in that side that is turned fromwarde the Sunne, he sæmeth alway voyd, and the side toward the Sunne full of light.

A Particuler Table of the mooueable

feasts, seruing for 44. yeeres, according to the new reformed order in forraine Nations, necessary for all persons, which trauaile or haue any trafficke in those partes.

	The yeere of our lord.	The Sunday Letter.	Epact.	Septuagesima,	Ashe Wednesday.	Easter day.	Rogation, Sunday,
	1587	D	21	25. Janu.	11. Febru	29. Mar.	3. May.
B	1588	C B	2	14. Febr.	2. Marc.	17. Aprill.	22. May.
	1589	A	13	29. Janu.	15. Febr.	2. Aprill.	7. May.
	1590	G	24	18. Febr.	7. Marc.	22. Aprill.	27. May.
	1591	F	5	10. Febr.	27. Febru	14. April.	19. May.
B	1592	E D	16	26. Janu.	12. Febru.	29. Mar.	3. May.
	1593	C	27	14. Febr.	3. Marc.	18. Aprill.	23. May.
	1594	B	8	6. Febru.	23. Febru.	10. Aprill.	15. May.
	1595	A	19	22. Janu.	8. Febru.	26. Mar.	30. April.
B	1596	G F	1	11. Febru.	28. Febru.	14. April.	19. May.
	1597	E	12	2. Febru.	18. Febru.	6. Aprill.	11. May.
	1698	D	23	28. Janu	4. Febru.	22. Mar.	26. April.
	1599	C	4	7. Febru.	24. Febru	11. Aprill.	16. May.
B	1600	B A	15	30. Janu.	16. Febru.	2. Aprill.	7. May.
	1601	G	26	18. Febru.	7. Marc.	22. Aprill.	27. May.
	1602	F	7	3. Febr.	20. Febru.	7. Aprill.	12. May.
	1603	E	18	16. Janu.	12. Febru.	30. Mar.	4. May.
B	1604	D C	29	15. Febr.	3. March.	18. Aprill.	23. May.
	1605	B	10	16. Febru.	23. Febru.	10. April.	15. May.
	1606	A	21	22. Janu.	8. Febru.	26. Mar.	30. April.

A Particuler Table of the mooueable feastes in Forraine Nations.

Ascention day.	Whit sunday.	Trinitie Sunday.	Corpus christi. day.	Aduent Sunday.
7 .May.	17. May.	24. May,	28. May.	29. Nouẽ
26. May.	5. June.	12. June.	16. June.	27. Nou.
11. May.	21. May.	28. May.	1. June.	3. Decẽb.
31. May.	10. May	17. June.	21. June.	2. Decem
23. May.	2. June.	9. June.	13. June.	1. Decem.
7. May.	17. May.	24. May.	28. May.	29. Nou.
27. May.	6. June.	13. June.	17. June.	28. Nou.
19. May.	29. May.	5. June.	9. June.	27. Nou.
4. May.	14. May.	21. May.	25. May	3. Decem.
23, May.	2, June.	9. June.	13. June.	1. Decem.
15. May.	25. May.	1. June	5. June.	30. Nou.
30. Aprill.	10. May.	17. May.	21. May.	29. Nou
20. May.	30. May.	6. June.	10, June.	28. Nou.
11. May.	21. May,	28. May.	1. June.	3. Decẽ.
31. May.	10. June.	17. June.	21. June.	2. Decem.
16. May.	26. May.	2. June.	6. June.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
27. May.	6. June.	13. June.	17, June.	28. Nou.
19. May.	29. May.	5. June.	9. June.	27. Nou.
4. May.	14. May.	21. May.	25, May.	3. Decem.

A perticular Table of the Mooueable Feastes in forraine Nations.

	The yeere of our lord.	The Sunday Letter.	Epact.	Septuagesima,	Ashe Wednesday.	Easter day.	Rogation, Sunday,
	1607	G	2	11. Febr.	28. Febru	15. Apr.	20. May.
B	1608	f E	13	3. Febr.	20. Febr.	16. Apr.	11. May.
	1609	D	24	15. Febr.	4. Marc.	19. Apr.	24. May.
	1610	C	5	7. Febr.	24. Febru	11. Apr.	16. May.
	1611	B	16	30. Janu.	16. Febru.	3. Apr.	8. May.
B	1612	A G	27	19. Febru.	7. Marc.	22. Apr.	27. May.
	1613	F	8	3. Febru.	20. Febru	7. Apr.	12. May.
	1614	E	19	26. Janu.	12. Febru.	30. Mar.	4. May.
	1615	D	1	15. Febru.	4. Marc.	9. Apr.	24. May.
B	1616	C B	12	31. Janu.	17. Febru.	3. Apr.	8. May.
	1617	A	23	22. Janu.	8. Febru.	26. Mar.	30. Apr.
	1618	G	4	11. Febru.	28. Febru.	15. Apr.	20. May.
	1619	F	15	27. Janu	13. Febru.	31. Mar.	5. May.
B	1620	E D	26	16. Febr.	4. Marc.	19. Apr.	24. May.
	1621	C	7	7. Febru.	24. Febru.	11. Apr.	16. May.
	1622	B	18	32. Janu.	9. Febru.	27. Mar.	1. May.
	1623	A	29	12. Febr.	1. March.	16. Apr.	21. May.
B	1624	G f	10	28. Janu.	14. Febru.	31. Mar.	5. May.
	1625	E	21	26. Janu.	12. Febru.	30. Mar.	4. May.
	1626	D	2	8. Febru.	25. Febru.	12. Apr.	17. May.
	1627	C	13	31. Janu.	17. Febr.	4. Apr.	9. May.
B	1628	B A	24	26. Febr.	8. Marc	23. Apr.	28. May
	1629	G	5	11. Febru.	28. Febr.	15. Apr.	20. May.
	1630	f	16	27. Janu.	13. Febr.	31. Marc.	5. May

A Particuler Table of the mooueable feastes in Forraine Nations.

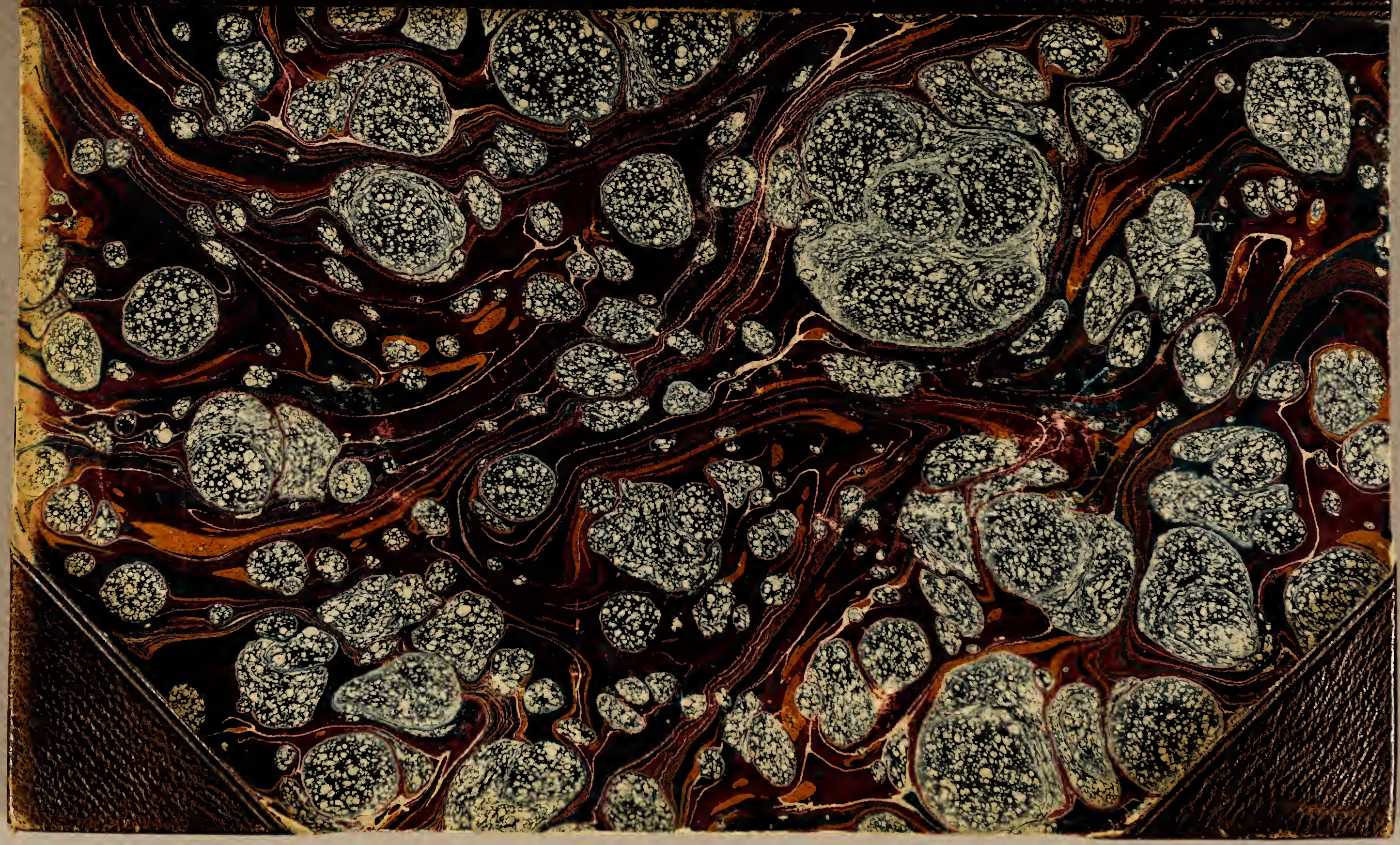
Ascention day.	Whit sunday.	Trinitie Sunday.	Corpus christi day.	Aduent Sunday.
24. May.	3. June.	10. June.	14. June.	2. Decem.
15. May.	25. May.	1. June.	5. June.	30. Nou
28. May.	7. June.	14. June.	18. June.	29. Nouē
20. May.	30. May.	6. June.	10. June.	28. Nou
12. May.	22. May.	29. May.	2. June.	27. Nou.
31. May.	10. June.	17. June.	21. June.	2. Deceb.
16. May.	26. May.	2. June.	6. June.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
28. May.	7. June.	14. June.	18. June.	29. Nou.
12, May.	22. May.	29. May.	2. June.	27. Nou.
4. May.	14. May.	21. May.	25. May.	3. Decem.
24. May.	3. June.	10. June.	14. June.	2. Decem
9. May.	19. May.	26. May.	30, May.	1. Decem.
28. May.	7. June.	14. June	18. June.	29. Nou
20. May.	30. May.	6. June.	10. June.	28. Nou.
5. May.	15. May.	22. May.	26. May.	27. Nou.
25. May.	4. June.	11. June.	15. June.	3. Decē.
9. May.	19. May.	26. May.	30, May.	1. Decem.
8. May.	18. May.	25. May.	29. May.	30. Nou.
21. May.	31. May.	7. June.	11, June.	29. Nou.
13, May.	23. May.	30, May.	3. June.	28. Dece.
1. June.	11. June.	18. June.	22. June.	2. Decem.
24. May	3. June.	10. June.	14. June.	2. Dece.
9. May.	19. May,	16. June.	20. June.	1. Decem.

97-03

Perfect
(title a little rubbed and
fore-edge remargined),

74

D587
T167m

54,(2) ff. 1 woodcut plate

H80